5-4610-221-12

TM 5-4610-221-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

WATER PURIFICATION UNIT: VAN-TYPE BODY MOUNTED;

ELECTRIC DRIVEN, AC, 115, 208V SINGLE- AND 3-PHASE, 60 HERTZ 1/2 to 2 HP, 1500 GPH

(MET-PRO MODEL 1500-2600A)
NSN 4610-00-879-4612
(ETC MODEL S1500)
NSN 4610-01-016-9964

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HEADQUARTERS DEPARTMENT OF THE ARMY

5 MARCH 1979

D 101.11:

WARNING

Safety Precautions apply before, during and after operation.

Purify the best and cleanest water available.

Avoid taking water near a bathing area, sewer outlet, latrine, oily area, refuse site, or camp drainage area. Static electricity and current leakage from electrical equipment builds up in truck and van body and can cause injury or death to personnel by shock unless proper grounding is accomplished.

Protect eyes and skin from direct contact with chemicals and solutions. Be especially careful when opening chemical containers to avoid inhaling chemical powder.

Be careful when pouring chemical solutions into solution tanks. Chemical splashed on skin and eyes will cause irritation.

Accidental mixing of calcium hypochlorite and ferric chloride will produce a chlorine gas. Chlorine gas is an irritant to the respiratory tract, which can cause tracheo-bronchitis, pulmonary edema and in sufficient concentration can lead to death.

Do not mix dry calcium hyprochlorite and activated carbon together. They may react violently causing fire and explosion.

Do not touch metal parts with bare hands when temperature is extremely low.

Hydrochloric acid can cause severe skin burns and damage to eyes. Handle it with care and avoid breathing fumes. If solution should come into contact with eyes or skin, rinse immediately with clear water and consult a doctor.

Be certain that electrical supply lines are disconnected before performing any maintenance on electrical system.

Air that is released from pressure valve can cause serious injury to personnel if standing too close. If any of the stacks have been punctured, thoroughly ventilate the rectifier before removal to prevent inhalation of poisonous fumes.

Do not handle a damaged rectifier if it is hot. The poisonous selenium compound contained in stacks can be absorbed through the skin.

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangers to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

Operation of this equipment presents a NOISE HAZARD to personnel in the area. The noise level exceeds allowable limits for unprotected personnel. Wear ear muffs or earplugs which were fitted by a trained professional.

Be certain all personnel are clear before starting accessible rotating/moving mechanical components. Remain clear of these components when unit is in operation. Be particularly careful when working around erdlator agitator drive.

CAUTION

Water Purification Equipment Set Turn-In

Opened or broken packages of chemicals (i.e., ferric chloride and calcium hypochlorite) are highly caustic and can have a harmful effect, during extended periods of storage, on the interior surface of the van body and its components.

When turning in a Water Purification Equipment Set as unserviceable or excess, the following actions will be taken:

All partially consumed or opened chemicals will be utilized and/or destroyed locally.

All unopened chemicals will be individually packaged and will not be stored for shipment inside water purification unit van body.

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 9 May 1988

Operator and Organizational Maintenance Manual

WATER PURIFICATION UNIT: VAN-TYPE BODY MOUNTED; ELECTRIC DRIVEN, AC, 115, 208V SINGLE- AND 3-PHASE, 60 HERTZ ½ TO 2 HP, 1500 GPH (MET-PRO MODEL 1500-2600A) NSN 4610-00-879-4612 (ETC MODEL S1500) NSN 4610-01-016-9964

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General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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To be distributed in accordance with DA FOrm 12-25A, Operator and Unit Maintenance requirements for Water Purification Unit, Electric, Van Type, Body Mounted, 115/208V, 60HZ, 1&3 PH, ½-2 HP, 1500 GPM (1500-2600A).

CHANGE
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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 26 August 1987

Operator and Organizational Maintenance Manual

WATER PURIFICATION UNIT: VAN-TYPE BODY MOUNTED; ELECTRIC DRIVEN, AC, 115, 208V SINGLE- AND 3-PHASE, 60 HERTZ ½ TO 2 HP, 1500 GPH

(MET-PRO MODEL 1500-2600A) NSN 4610-00-879-4612
(ETC MODEL S1500) NSN 4610-01-016-9964

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 1 December 1986

Operator and Organizational Maintenance Manual
Water Purification Unit; Van-Type Body Mounted;
ELECTRIC DRIVEN, AC, 115, 208V
SINGLE-AND 3-PHASE, 60 HERTZ
1/2 to 2 HP, 1500 GPH
(MET-PRO MODEL 1500-2600A)
NSN 4610-00-879-4612
(ETC MODEL S1500)
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CHANGE }
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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 September 1981

Operator and Organizational Maintenance Manual

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TECHNICAL MANUAL
No. 4-4610-221-12

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DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 5 March 1979

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL WATER PURIFICATION UNIT; VAN-TYPE BODY MOUNTED:

ELECTRIC DRIVEN, AC, 115, 208V, SINGLE- AND 3-PHASE, 60 HERTZ 1/20 to 2 HP, 1500 GPH
(MET-PRO MODEL 1500-2600A)
NSN 4610-00-879-4612
(ETC MODEL S1500)
NSN 4610-01-016-9964

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You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. These instructions are published for use by personnel to whom the Van-Type Body Mounted Water Purification Unit, MetPro Model 1500-2600A or ETC Model S1500 is issued. Chapters 1 through 3 provide information on operation and operator/crew maintenance service of equipment, accessories, components, and attachments. Also included are descriptions of main units and their functions in relationship to other components. Chapter 4 provides information for organizational maintenance services.

1-2. Maintenance Forms and Records.

Equipment Maintenance and procedures for their use are contained in DA PAM 738-750, The Army Maintenance Management System (TAMMS).

NOTE

Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicles Operator's Identification Card) which is carried by the operator, shall be kept in a canvas bag mounted on the equipment.

1-3. Administrative Storage.

a. Storage Site.

(1) Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area "Administrative Storage."

(2) Covered space is preferred. When sufficient covered space for all items to be stored is not available, priority should be given to items which are most susceptible to deterioration.

(3) Open sites should be improved hardstand, if available. Unimproved sites should be firm, well drained, and kept free of excessive vegetation.

(4) Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period appropriate maintenance records will be kept.

(5) Before placing equipment in administrative storage, current maintenance services and equipment serviceable criteria (ESC) evaluations should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWO's) should be applied.

b. Storage Plan.

(1) Store equipment so as to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.

(2) Take into account environmental conditions, such as extreme heat or cold; high humidity; blowing sand, dust, or loose debris; soft ground; mud, heavy snows; earthquakes; or combinations thereof and take adequate precautions.

(3) Establish a fire plan and provide for adequate firefighting equipment and personnel.

1-4. Destruction of Material to Prevent Enemy Use.

a. General. When capture of the water purification unit by an enemy or abandonment of it to the enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy vital parts of water purification units and all corresponding repair parts.

b. Mechanical Means. Use sledge hammers, crowbars, picks, axes, or other heavy tools which may be available together with tools normally included with water purification unit to demolish the following vital parts in order of priority listed. Completion of the first five steps will render the unit inoperative. Completion of the additional steps listed will completely destroy equipment.

(1) Erdlator tank and filters.

(2) Instruments, controls, and valves.

(3) Truck, generator engine and accessories.

(4) Puncture the fuel tank.

(5) Slash tires, hoses, and fabric tanks.

NOTE

The above steps are minimum requirements for this method.

(6) Pumps and electric motors.

(7) Wiring and piping.

(8) Filter heads and filter elements.

(9) Chemical feed equipment.

(10) Cut all accessible cables, fuel, hydraulic and coolant lines.

(11) Chemical containers.

(12) Van Body.

c. *Misuse.* Perform steps listed below to make unit inoperative.

(1) Drain lubricant and coolant from engine.

(2) Put sand, pulverized limestone, or ferric chloride into truck engine and gasoline driven pump engines.

(3) Start engine and operate at full throttle.

(4) Start water purification electric motors and jam mechanism so that motors will burn out.

(5) Drop small gravel, nuts, or metal scraps into the suction side of the pumps and operate them.

d. *Explosives.* Place as many of the following charges (fig. 1-1) as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator. Listed below are the vital parts in order of priority of demolition. Completion of the first five steps will render the unit inoperative. Completion of the additional steps will completely destroy equipment.

(1) A 2-pound (0.9 kg) charge on top of transmission case housing.

(2) A 2-pound (0.9 kg) charge as low on left side of engine as possible.

(3) A 1-pound (0.45 kg) charge between each filter pump and electric motor.

(4) A 2-pound (0.9 kg) charge in erdlator assembly.

(5) A 2-pound (0.9 kg) charge in each filter. Remove one element to place this charge.

NOTE

The above charges are minimum requirements for this method.

(6) A 2-pound (0.9 kg) charge over each set of wheels and axle.

(7) A 1-pound (0.45 kg) charge in the personnel heater. Open the access door.

(8) A 2-pound (0.9 kg) charge in the midst of all coiled hose. Pile fabric tanks and covers and bags of chemicals on this charge.

e. *Weapons Fire.* Fire on the unit with heaviest weapons available. Direct fire at pumps, erdlator assembly, and diatomite filters.

f. *Scattering and Concealment.* Remove all easily accessible vital parts such as engine accessories, electric control cabinet parts, hoses, fittings, filter elements, and tools. Scatter these parts through dense foliage, bury them in dirt or sand, or throw them into a lake, stream, or other body of water. Bags of chemicals should be broken and contents scattered on the ground or in a body of water.

g. *Burning.* Pack fabric tanks, covers, and hose around the water purification unit. Saturate this packing with gasoline, oil or diesel fuel and ignite it.

h. *Submersion.* Totally submerge unit in a body of water to afford some water damage and concealment. A body of salt water will do the greatest damage to the metal parts.

i. *Training.* All operators should receive thorough training in the destruction of the truck mounted water purification unit. Simulated destruction, using all of the methods listed above, should be included in the operator's training program. If must be emphasized in training that demolition operations are usually necessitated by critical situations when time available for destruction is limited. For this reason, it is necessary that operators be thoroughly familiar with all methods of destruction and be able to carry out demolition instructions without reference to this or any other manual.

j. *Additional Information.* For additional information on procedures for destruction of equipment to prevent enemy use, refer to TM 750-244-3.

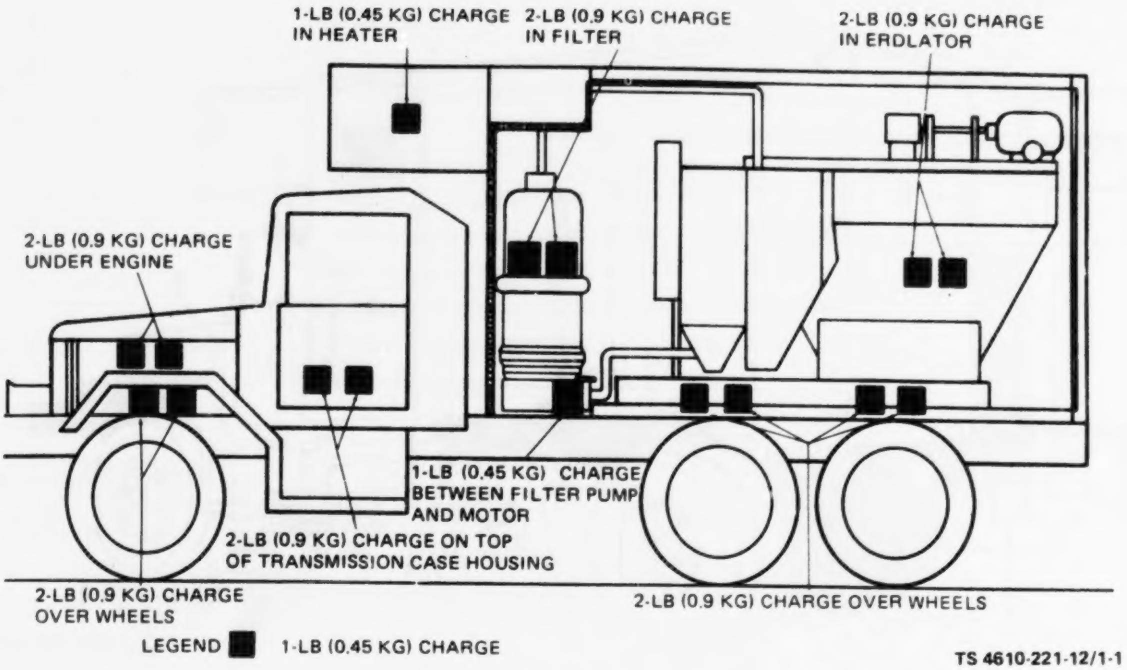
1-LB (0.45 KG) CHARGE IN HEATER
2-LB (0.9 KG) CHARGE IN FILTER
2-LB (0.9 KG) CHARGE IN ERDLATOR
2-LB (0.9 KG) CHARGE UNDER ENGINE
1-LB (0.45 KG) CHARGE BETWEEN FILTER PUMP AND MOTOR
2-LB (0.9 KG) CHARGE ON TOP OF TRANSMISSION CASE HOUSING
2-LB (0.9 KG) CHARGE OVER WHEELS
2-LB (0.9 KG) CHARGE OVER WHEELS
LEGEND ■ 1-LB (0.45 KG) CHARGE
TS 4610-221-12/1-1

Figure 1-1. Placement of Demolition Charges

1-5. Reporting Equipment Recommendations (EIR).

EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why design is unfavorable or why a procedure is difficult. EIR's may be submitted on SF36B (Quality Deficiency Report). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. Mail directly to Commander, Headquarters, U.S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MEM, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished directly to you.

Section II. DESCRIPTION AND DATA

1-6. Description.

a. General. The van-type body mounted water purification unit, Met-Pro Model 1500-2600A and ETC Model S1500, consists of water purifying equipment installed inside an insulated and heated van body (1, fig. 1-2). The water purifying equipment consists primarily of the water treatment section, where raw water is mixed and treated with chemicals; the filter section, where chemically treated raw water has impurities removed; and necessary valves, piping, and controls to direct production of potable and palatable drinking water from fresh water at the rate of 1500 gph (gallons per hour) (5677 liters per hour).

b. Van Body. The van body (1, fig. 1-2) has a rear door (8) and a side door (3). The rear entrance is accessible by a two step, ladder assembly (7) and the side door by a stair-type ladder assembly (2). The side door has an insulated stationary window and the window in rear door is adjustable to permit van body ventilation. The left side doors (2, fig. 1-3) may be opened in temperate weather to be used as an operating platform. The top left side door also has an insulated stationary window. The bonnet doors (1) provide accessibility for maintenance of the personnel heater.

c. Water Treatment Section.

(1) Chemical feed equipment. The chemical feed equipment consists of a slurry feeder assembly

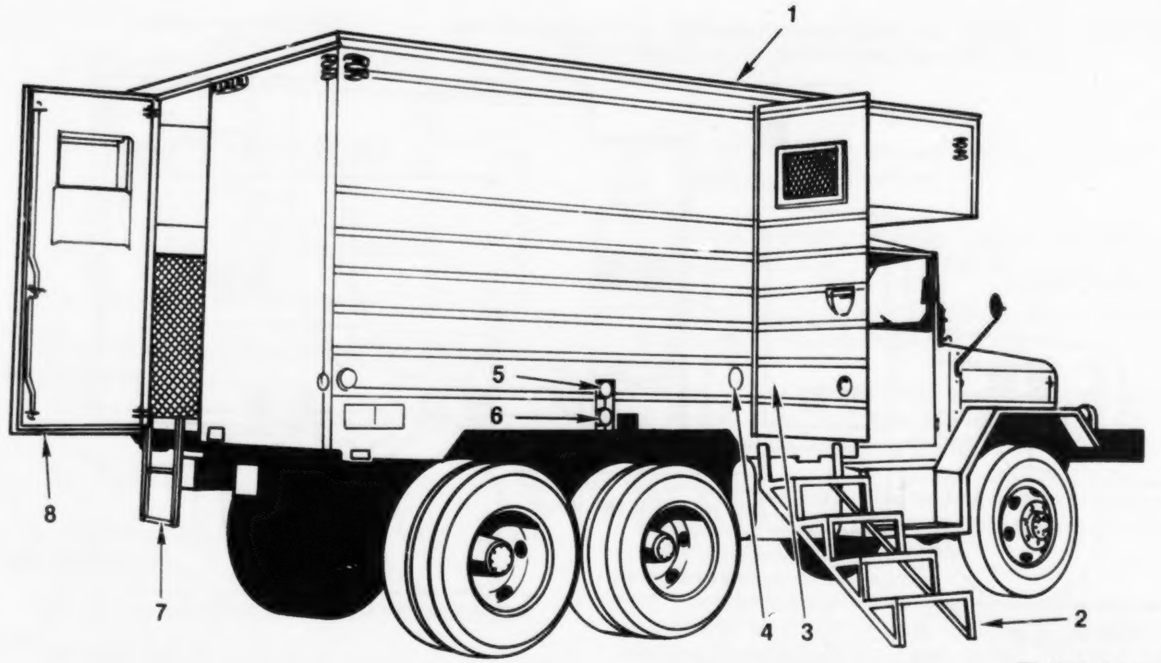

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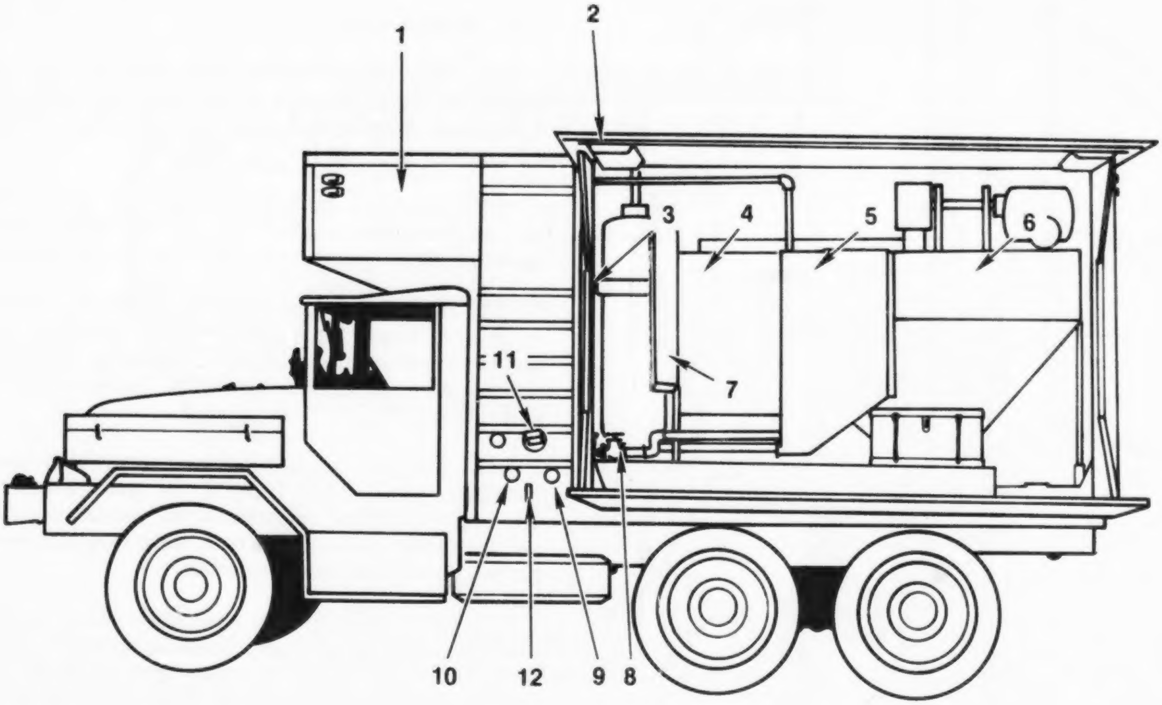
Figure 1-2. Water Purification Unit Mounted on Van Body, Right Rear View

(1, fig. 1-4) that has two compartments and a chemical solution feeder assembly (4). Pulverized limestone is mixed with raw water to create a limestone slurry in one compartment and diatomaceous earth and filtered water is mixed in the other compartment to create a diatomite slurry. The limestone slurry is fed to the erdlator tank (6, fig. 1-3) where it is mixed with ferric chloride and calcium hypochlorite which is supplied by the chemical solution feeder assembly (4, fig. 1-4). The diatomite slurry is fed to the diatomite tank (2) where it is diluted with coagulated water, then on to the diatomite filter assembly (3, fig. 1-3) where it coats filter elements to act as a filtering aid. The slurry feeder assembly is electric motor driven through a slurry feeder gear assembly (3, fig. 1-4).

(2) Erdlator assembly. The erdlator assembly includes the erdlator tank (6, fig. 1-3), sludge concentrator tank (4), and wet well tank (5). The erdlator tank is the area where raw water is first introduced through aspirators (2, fig. 1-5) into influent launder (1). The raw water then overflows into mixing zone (3) of erdlator tank where it is mixed with limestone slurry, calcium hypochlorite, ferric chloride and, when necessary, activated charcoal. The erdlator agitator (7) causes chemically saturated raw water to rotate and flow out the bottom of the mixing zone into clarification zone (6) of erdlator tank. The chemically saturated water is then separated in the clarification zone of erdlator tank and limestone forms a slurry blanket of floc to remove suspended organic matter. The water from which organic matter has been removed will rise above slurry blanket and be drawn off through effluent launder (4). The water drawn off by effluent launder is called coagulated

Legend for figure 1-2:

1. Van body
2. Ladder assembly
3. Right side door
4. Cable outlet cap
5. Hose cap (raw water outlet)
6. Hose cap (waste water outlet)
7. Ladder assembly
8. Rear door



TS 4610-221-12/1-3

Figure 1-3. Water Purification Unit Mounted on Van Body, Left Side View

Legend for figure 1-3:

1. Bonnet door (2)
2. Left side door
3. Diatomite filter assembly
4. Sludge concentrator tank
5. Wet well tank
6. Erdlator tank
7. Control cabinet
8. Filler pump assembly
9. Hose cap (water waste outlet)
10. Hose cap (water waste outlet)
11. Cable outlet cap
12. Ground stud

water. The coagulated water is piped to the wet well tank (5, fig. 1-3) which acts as a sump for filter pump assembly (8) and provides limited storage for coagulated water. When the slurry blanket in erdlator tank rises too high, excess slurry blanket is drawn off through the slurry weir box to the sludge concentrator tank (5, fig. 1-5). The sludge concentrator tank permits the slurry to further settle and the organic free water, or coagulated water, is then drawn off from sludge concentrator tank to wet well tank.

d. Filter Section. The filter section consists of a diatomite filter assembly (3, fig. 1-3), filter pump assembly (8), piping, and gages. The filter is designed to employ filtration properties of diatomaceous earth to remove suspended matter from coagulated water and is provided with an air release valve which allows backwashing of filter elements. The filter pump electric motor is operated from control cabinet (7) located on front of sludge concentrator tank. The control cabinet also contains controls for all electrical drive components and supporting equipment.

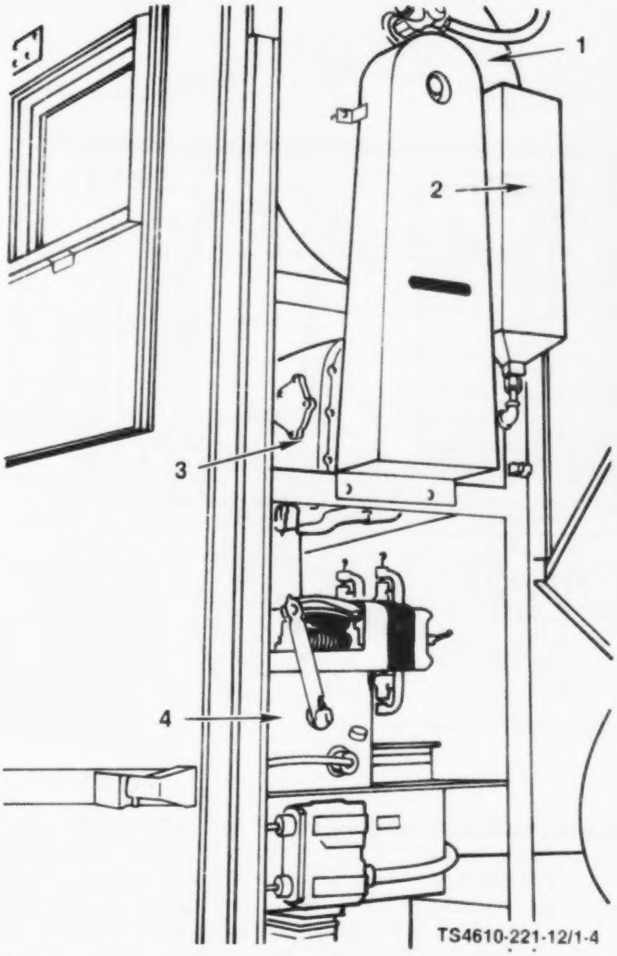


Figure 1-4. Chemical Feed Equipment

Legend for figure 1-4:

1. Slurry feeder assembly
2. Diatomite dilution tank
3. Slurry feeder gear assembly
4. Chemical solution feeder assembly

1-7. Tabulated Data.

NOTE

> *Data plates are depicted for both models of the water purification unit.*

a. Identification.

(1) The transportation data plate (A, fig. 1-6), located on right rear side of van body, gives length, width, and height in inches and shipping cubage, weight, and tonnage for van body only.

(2) The van body identification plate (B), located on lower right rear of van body, gives manufacturer's name, type, date, and serial number.

(3) The heater identification plate (C), located on front of heater, provides starting, operating, and stopping instructions. It also specifies manufacturer, model, serial number, volts, cycles, amperes, and rating in BTU.

(4) The erdlator agitator gear assemblies identification plate (D), located on gear assembly housing, specifies manufacturer, model number, service factor, ratio, input rpm, output rpm, horsepower, torque, and serial number.

(5) The filter pump assembly identification plate (E), located on pump housing specifies manufacturer, type, serial number, gpm (gallons per minute), hd-ft (head-foot), and rpm (revolutions per minute).

(6) The slurry feeder assembly identification plate (F), located on the front of the slurry feeder assembly, specifies the manufacturer, component name, model number, serial number, part number, and capacity measured in gph.

(7) The filter pump motor assembly identification plate (G), located on top of the motor stator cover, specifies manufacturer, phase, amperes, type, frame, horsepower, cycles, rpm, duty, temperature rise, ambient temperature, class, and motor model.

(8) The erdlator agitator motor assembly identification plate (H), located on the motor stator, specifies manufacturer, horsepower, rpm, phase, volts, amperes, cycles, temperature rise, frame service factor, model number, serial number, and code.

(9) The slurry feeder motor assembly identification plate (1), located on the motor stator, specifies manufacturer, horsepower, rpm, volts, amperes, cycles, temperature rise, frame, service factor, model number, serial number, and code.

(10) The air release valve identification plate (J), located on the front of the valve housing, specifies manufacturer, component name, model and part number.

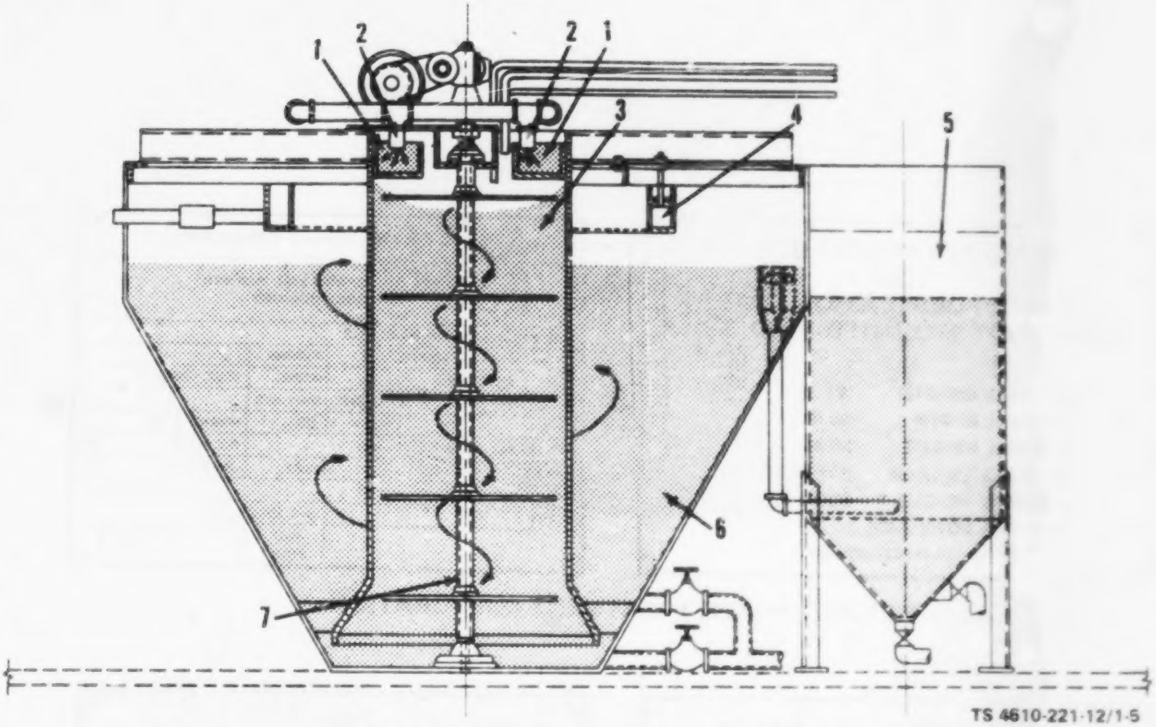


Figure 1-5. Cross Section of Erdlator Assembly

Legend for figure 1-5:

1. Influent launder
2. Aspirator (4)
3. Mixing zone
4. Effluent launder
5. Sludge concentrator tank
6. Clarification zone
7. Erdlator agitator

(11) The chemical solution feeder assembly identification plate (K), located on the rear of solution feeder housing, specifies manufacturer, component name, part number, model number, serial number, volts, cycles, phase, amperes, type, oil, and capacity.

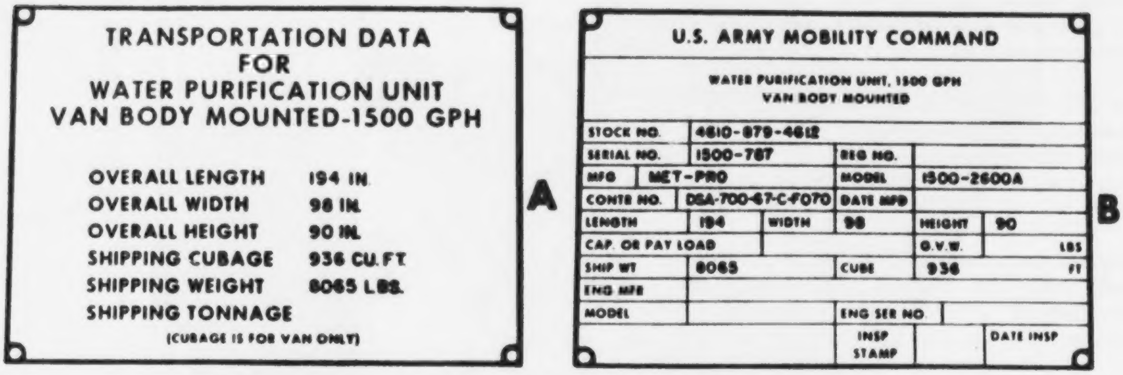
(12) The diatomite filter assembly identification plate (L), located on the front of the filter, specifies manufacturer, component name, model number, serial number, and part number.

(13) The erdlator tank assembly identification plate (M), located on erdlator tank, specifies manufacturer, component name, model number, serial number, part number and capacity.

(14) The slurry feeder gear assembly identification plate (N), located on the gear assembly housing, specifies manufacturer, model number, service factor, ratio, input rpm, output rpm, horsepower, torque, and serial number.

b. Tabulated Data (Operator Maintenance).

(1) General. The maintenance data for the operator is tabulated in following subparagraphs. Refer to applicable technical manuals for truck chassis tabulated data and cargo trailer tabulated data.



TRANSPORTATION DATA
FOR
WATER PURIFICATION UNIT
VAN BODY MOUNTED-1500 GPH

OVERALL LENGTH	194 IN.
OVERALL WIDTH	98 IN.
OVERALL HEIGHT	90 IN.
SHIPPING CUBAGE	936 CU. FT.
SHIPPING WEIGHT	8065 LBS.
SHIPPING TONNAGE	

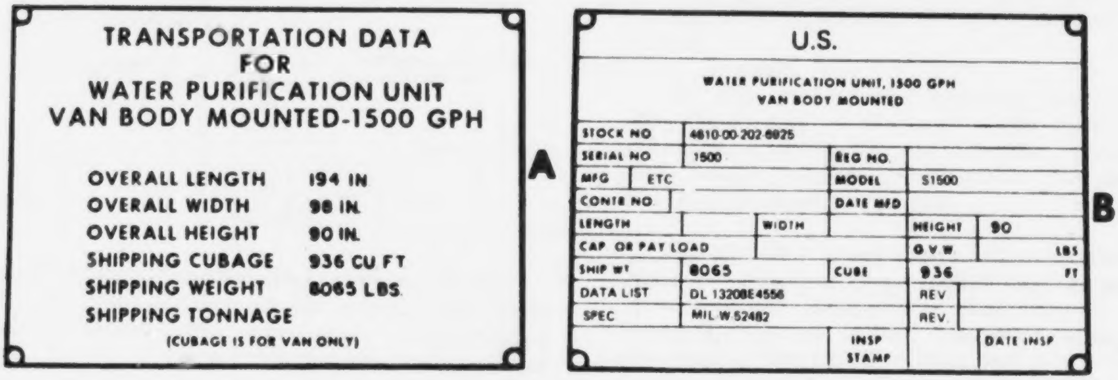
(CUBAGE IS FOR VAN ONLY)

U.S. ARMY MOBILITY COMMAND

WATER PURIFICATION UNIT, 1500 GPH
VAN BODY MOUNTED

STOCK NO.	4610-879-4612				
SERIAL NO.	1500-787	REG NO.			
MFG	MET-PRO	MODEL	1500-2600A		
CONTR NO.	DSA-700-67-C-F070	DATE MFD			
LENGTH	194	WIDTH	98	HEIGHT	90
CAP. OR PAY LOAD		G.V.W.	LBS		
SHIP WT	8065	CUBE	936 FT		
ENG MFR					
MODEL		ENG SER NO.			
	INSP STAMP		DATE INSP		

MET-PRO WATER TREATMENT CORPORATION



TRANSPORTATION DATA
FOR
WATER PURIFICATION UNIT
VAN BODY MOUNTED-1500 GPH

OVERALL LENGTH	194 IN
OVERALL WIDTH	98 IN.
OVERALL HEIGHT	90 IN.
SHIPPING CUBAGE	936 CU FT
SHIPPING WEIGHT	8065 LBS.
SHIPPING TONNAGE	

(CUBAGE IS FOR VAN ONLY)

U.S.

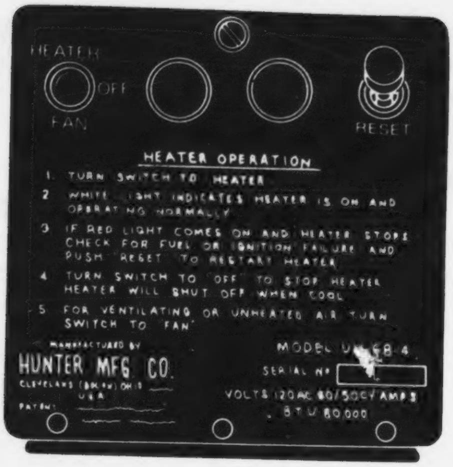
WATER PURIFICATION UNIT, 1500 GPH
VAN BODY MOUNTED

STOCK NO	4610-00-202-6925				
SERIAL NO	1500	REG NO.			
MFG	ETC	MODEL	S1500		
CONTR NO.		DATE MFD			
LENGTH		WIDTH		HEIGHT	90
CAP. OR PAY LOAD		G V W	LBS		
SHIP WT	8065	CUBE	936 FT		
DATA LIST	DL 13208E4556	REV			
SPEC	MIL-W-52482	REV.			
	INSP STAMP		DATE INSP		

ENVIRONMENTAL TECTONICS CORPORATION

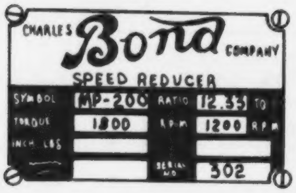
TS 4610-221-12/1-6 ①

Figure 1-6. Identification Plates (Sheet 1 of 3)


HEATER
OFF
FAN
RESET
HEATER OPERATION
1. TURN SWITCH TO HEATER
2 WHITE LIGHT INDICATES HEATER IS ON AND OPERATING NORMALLY
3 IF RED LIGHT COMES ON AND HEATER STOPS CHECK FOR FUEL OR IGNITION FAILURE AND PUSH RESET TO RESTART HEATER
4 TURN SWITCH TO OFF TO STOP HEATER HEATER WILL SHUT OFF WHEN COOL
5 FOR VENTILATING OR UNHEATED AIR TURN SWITCH TO FAN
MANUFACTURED BY
HUNTER MFG. CO.
CLEVELAND (BRUSH) OHIO
U.S.A.
PATENT
MODEL U 68-4
SERIAL No
VOLTS 120AC 60/50CY AMPS
BTU 80,000

C

D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Bond
COMPANY
SPEED REDUCER
SYMBOL
MP-200
RATIO
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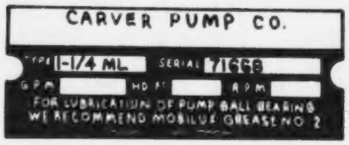
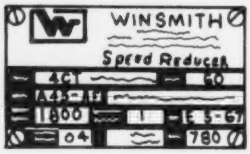
TO
TORQUE
1800
R.P.M.
1200
R.P.M.
INCH LBS
SERIAL NO.
302

E


CARVER PUMP CO.
TYPE
1-1/4 ML
SERIAL
71668
G.P.M.
HD FT
R.P.M.
FOR LUBRICATION OF PUMP BALL BEARING
WE RECOMMEND MOBILUX GREASE NO. 2

F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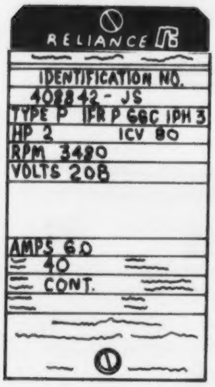
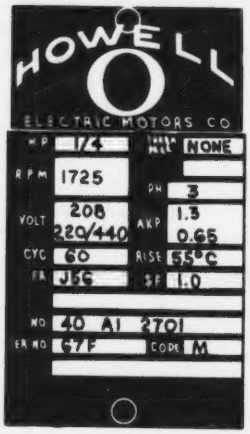
Speed Reducer
4CT
60
1800
04
780


RELIANCE
IDENTIFICATION NO.
408842 - JS
TYPE P
IFR P 66C
IPH 3
HP 2
ICV 80
RPM 3480
VOLTS 208
AMPS 6.0
40
CONT.

G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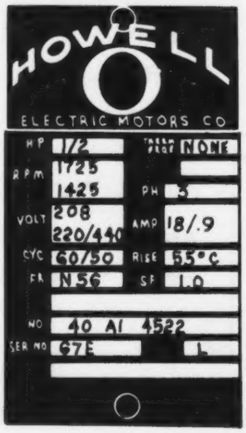
ELECTRIC MOTORS CO
HP
1/4
THERM PROT
NONE
RPM
1725
PH
3
VOLT
208
220/440
AMP
1.3
0.65
CYC
60
RISE
55°C
FR
J56
SF
1.0
NO
40 AI 2701
SER NO
67F
CODE
M

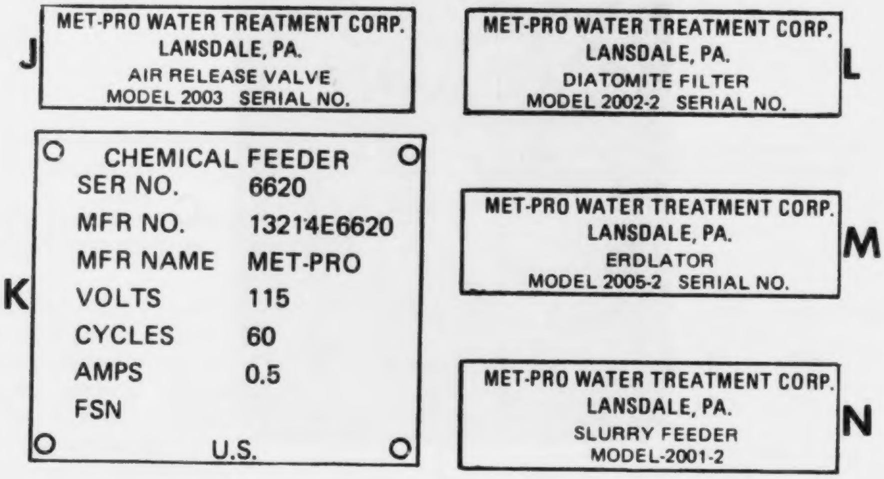
H


HOWELL
ELECTRIC MOTORS CO
HP
1/2
THERM PROT
NONE
RPM
1725
1425
PH
3
VOLT
208
220/440
AMP
18/.9
CYC
60/50
RISE
55°C
FR
N56
SF
1.0
NO
40 AI 4522
SER NO
67E
L

I

TS 4610-221-12/1-6 ②

Figure 1-6. Identification Plates (Sheet 2 of 3)



J

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
AIR RELEASE VALVE
MODEL 2003 SERIAL NO.

L

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
DIATOMITE FILTER
MODEL 2002-2 SERIAL NO.

K

CHEMICAL FEEDER

SER NO.	6620
MFR NO.	13214E6620
MFR NAME	MET-PRO
VOLTS	115
CYCLES	60
AMPS	0.5
FSN	

U.S.

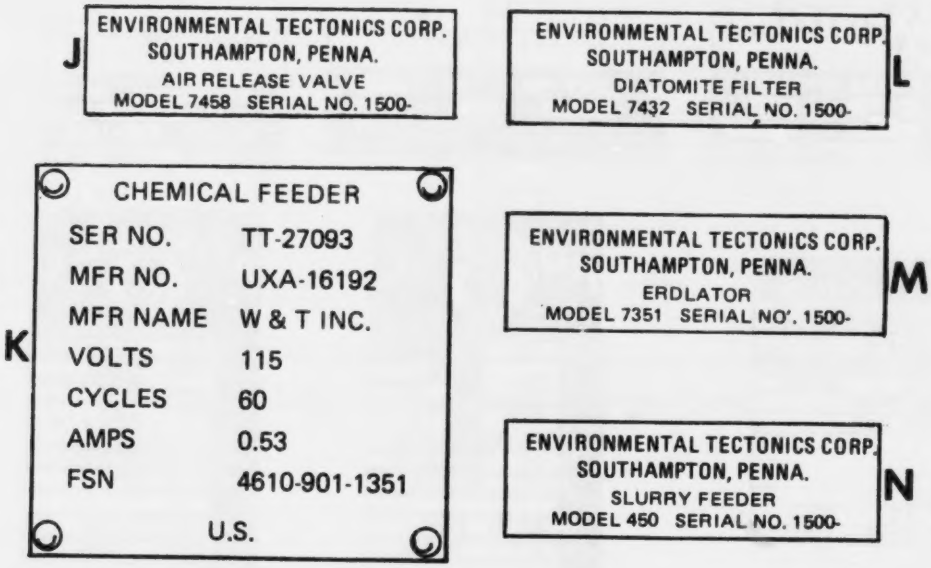
M

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
ERDLATOR
MODEL 2005-2 SERIAL NO.

N

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
SLURRY FEEDER
MODEL-2001-2

MET-PRO WATER TREATMENT CORPORATION



J

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
AIR RELEASE VALVE
MODEL 7458 SERIAL NO. 1500-

L

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
DIATOMITE FILTER
MODEL 7432 SERIAL NO. 1500-

K

CHEMICAL FEEDER

SER NO.	TT-27093
MFR NO.	UXA-16192
MFR NAME	W & T INC.
VOLTS	115
CYCLES	60
AMPS	0.53
FSN	4610-901-1351

U.S.

M

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
ERDLATOR
MODEL 7351 SERIAL NO. 1500-

N

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
SLURRY FEEDER
MODEL 450 SERIAL NO. 1500-

ENVIRONMENTAL TECTONICS CORPORATION

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Figure 1-6. Identification Plates (Sheet 3 of 3)

(2) Water purification unit.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Model	1500-2600A
Type	Van-type body
Capacity	1500 gph (5677 lph)

(3) Erdlator tank assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	13206E7358
Capacity	1500 gph (5677 lph)

(4) Diatomite filter assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	13206E7432
Type	Diatomaceous earth

(5) Slurry feeder assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	MPD9576-19-A
Capacity	14 gallons (53 1) per compartment

(6) Chemical solution feeder assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	13214E6620

(7) Rate of flow indicator.

Manufacturer	Brooks Instrument Co.
Service working pressure	500 psi (35.2 kg/sq cm)
Part number	L-3609-007
Flow range	0-50 gpm (189.3 lpm)

(8) Flow control valve.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Flow range	0-30 gpm (113.6 lpm)
Part number	13206E7481

(9) Water level alarm float valve.

Manufacturer	Hoffman Corp.
Part number	850
Type	87 Float
Working pressure	100 lb (45.4 kg)

(10) Three way plug valve (coagulated water).

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number	13212E6903-1
Type	3 way, 2 port, lubricated
Working pressure	200 lb (90.8 kg)

(11) Three way plug valve (filtered water).

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number	13212E6899
Type	3 way, 3 port, lubricated
Working pressure	200 lb (90.8 kg)

(12) Air release valve.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number	13206E7458
Model	5 sq in. (square inches)

c. *Tabulated Data (Organizational Maintenance).*

(1) General. The maintenance data for organizations is tabulated in the following subparagraphs. Refer to applicable technical manuals for truck chassis tabulated data and cargo trailer tabulated data. Tabulated data for 10 kw (kilowatt), alternating current, 110 volt, 1 and 3 phase, 60 Hz generator set and distribution pumps will be found in applicable technical manuals contained with equipment. A wiring diagram of water purification unit van body is shown in figure FO-1 (located in back of manual), and a wiring diagram of control cabinet is shown in figure FO-2 (located in back of manual).

(2) Chemical solution feeder assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number	13214E6620
Volts	115
Hertz	60
Phase	1
Pump	2 diaphragm
Maximum lift	6 ft (1.8 meters)
Vacuum	30 in.-lb
Strokes per minute	12
Range of pumping head	12 to 60 gal. per day (45.4 to 227.1 1 per day)
Feed rate	1/2 to 2-1/2 gph (1.9 to 9.5 lph)
Motor	Immersed in oil
Feeder oil capacity	1-1/4 quart (1.18 1)

(3) Slurry feeder assembly.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	MPD9576-19-A
Capacity	14 gallons (53 1) per compartment

(4) Slurry feeder gear assembly.

Manufacturer	Winsmith
Model	1-L-4CT
Service factor	2.0
Ratio	60:1
Input speed	1800 rpm
Output speed	29 rpm
Horsepower	3/4
Torque	780 ft-lb (107.8 kg/m)

(5) Slurry feeder motor assembly.

Manufacturer	Howell Electric Motor Company, Division of Kingston Conley
Horsepower	1/4
Speed	1725 rpm
Volts	208-220
Amperes	0.65
Hertz	60
Rise	55 degrees C (99 degrees F)
Frame	J-56
Part number	40-A2-2702
Design	B
Service factor	1.0

(8) Erdlator agitator gear assembly.

Manufacturer	Charles Bond Co.
Model	MP200
Service factor	2.0
Ratio	12.33:1
Input speed	1800 rpm
Output speed	146 rpm
Horsepower	1.25
Torque	400 ft-lb (55.3 kg/m)

(7) Erdlator agitator motor assembly.

Manufacturer	Howell Electric Motor Company Division of Kingston Conley
Horsepower	1/2
Speed	1725 rpm
Phase	3
Volts	208
Amperes	1.9
Hertz	60
Rise	55 degrees C (99 degrees F)
Frame	N56
Service factor	1.0
Serial number	UD/4643
Code	M
Part number	40-A1-4522

(8) Filter pump motor assembly.

Manufacturer	Reliance Motor Co.
Phase	3
Volts	208
Amperes	6.0
Type	P
Horsepower	2
Hertz	60

Frame	P56C
Speed	3450 rpm
Duty	Continuous
Rise	55 degrees C (99 degrees F)
Ambient temperature	40 degrees C (104 degrees F)
Class	Insulation A
Part number	406842AU

(9) *Filter pump assembly.*

Manufacturer	Carver Pump Co.
Serial Number	P101-4254
Type	1-1/4 ML
Head foot	115
Gallons per minute	25

(10) *Slurry feeder slip clutch assembly.*

Manufacturer	The Hilliard Corp.
Part number	L-4-1-312K
Torque	25 ft-lb (3.5 kg/m) output

(11) *Cabinet assembly electrical equipment.*

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part Number	D31206E7421

(12) *Stepdown transformer.*

Manufacturer	Jefferson Electric Co.
Type	115
Primary volts	115 ac (alternating current)
Secondary volts	6 ac
Hertz	60
Part number	230-221

(13) *Motor starter.*

Manufacturer	General Electric Co.
Type	CR 106 B002BCA
Class	2
Horsepower	2
Volts	208
Phase	3

(14) *START and STOP push switch.*

Manufacturer	General Electric Co.
Part Number	CR294OUM200A/294
Contact rating	600 volts

(15) *START push switch.*

Manufacturer	General Electric Co.
Part number	CR294OUA202B
Contact rating	600 volts

(16) *STOP push switch.*

Manufacturer	General Electric Co.
Part Number	CR294OUA202C
Contact rating	600 volts

(17) Circuit Breaker.

Manufacturer	Heineman Electric Co.
Amperes	30
Volts	120/240
Part number	2263-C curve 1-S

(18) Influent and effluent pressure gage.

Manufacturer	United States Gage Co., Ametek
Type	P644U
Range	0-100 psi (0-7.0 kg/sq cm)

(19) Raw water pressure gage.

Manufacturer	United States Gage Co., Ametek
Part number	P500 3-1/2 dial
Range	0-30 psi (0-2.1 kg/sq cm)

(20) Low water level sensitive switch.

Manufacturer	Micro Switch Corp., Division of Minneapolis-Honeywell Regulator Co.
Catalog number	BZV-2RN
Volts	125
Amperes	15
Actuated plunger pressure	9-24 oz (255-680 g)

(21) Personnel heater.

Manufacturer	Hunter Manufacturing Co.
Model	UH-68-4 unit serial numbers 784-994
Model	UH-68-D unit serial numbers 995-1083
Serial number range	4367-4586, 4770-5962
Volts	115 ac
Amperes	8.0
Fuel	Multi-fuel
Fuel consumption	3/4 gph (2.8 l)
Rated heat	60,000 BTU
Power consumption (starting)	40 watt
Power consumption (running)	800 watt
Air output	500 cubic feet per minute (14.2 cubic meters per minute)
Weight	120 lb (54.4 kg)
Width	21-3/16 in. (53.8 cm)
Height	11-1/16 in. (28.1 cm)
Length	28-3/8 in. (72.1 cm)
Ventilating motor:	
Volts	115
Phase	1
Hertz	60
Horsepower	1/6
Speed	1725 rpm
Combustion blower motor:	
Volts	115
Phase	1
Hertz	60
Horsepower	3/8
Speed	10,000 rpm

(22) Dimensions and weight (Water purification unit).

(a) Water purification unit mounted on truck chassis.

Length	280 in. (7.1 m)
Width	98 in. (2.5 m)
Height	131 in. (3.3 m)
Cubage	2144 cu. ft (60 cu. m)
Weight	19,000 lb (8618 kg)

(b) Water purification unit.

Length	194 in. (4.9 m)
Width	98 in. (2.5 m)
Width (with left side door open)	135 in. (3.4 m)
Height	90 in. (2.3 m)
Cubage	936 cu. ft (26 cu. m)
Weight	8065 lb (3658 kg)

(23) Capacities (Water purification unit).

Erdlator tank	530 gal. (2006 1)
Wet well tank	150 gal. (568 1)
Sludge concentrator tank	180 gal. (681 1)
Chemical solution tank	5 gal. (each) (19 1)
Slurry feeder assembly	14 gal. (each compartment) (53 1)
Water rise at 1500 gph	1.1 gpm per sq ft
Chemical solution feeder assembly gearcase	1-1/4 qts (quarts) (1.18 1)
Erdlator agitator gear assembly gearcase	18 fluid ounces (530 ml)
Slurry feeder gear assembly gearcase	24 fluid ounces (710 ml)

1-8. Difference in Models.

This manual covers the van-type body mounted water purification units, Met-Pro Model 1500-2600A and ETC Model S1500. Units bearing Serial Numbers 816 to 1083 have different right side and rear door hardware and raw water flowmeter than units bearing serial numbers 787-815. Serial numbers 995-1083 have a later model personnel heater than units bearing serial numbers 787-994. Differences between units carrying specific serial numbers are noted at each paragraph where applicable.

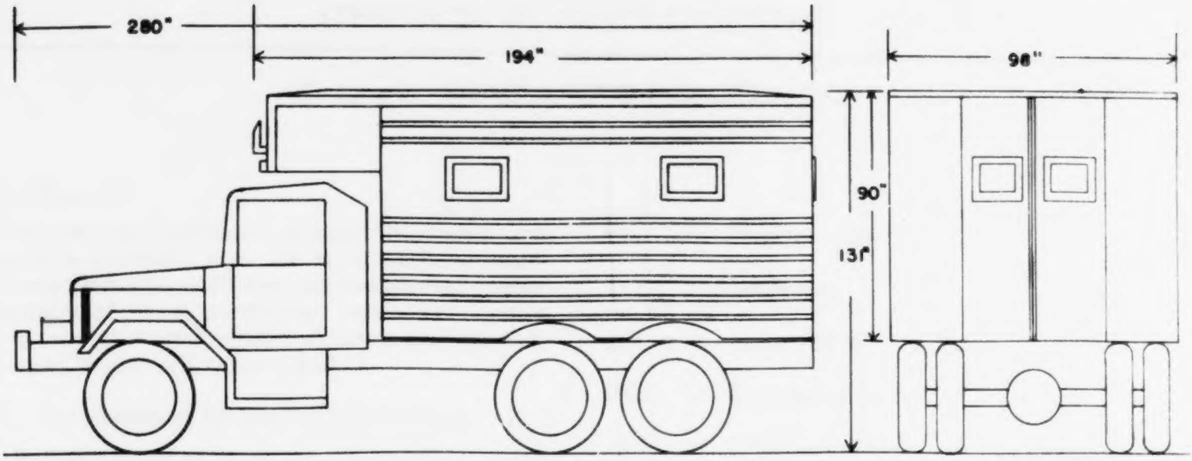
280"
194"
98"
90"
131"

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Figure 1-7. Shipping Dimensions.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

2-1. General.

This section describes, locates, illustrates and furnishes operator, crew, or organizational maintenance personnel sufficient information for proper operation of water purification units. For service upon receipt of equipment and moving equipment, refer to Chapter 4, Sections I and II.

2-2. Installation or Setting Up Instructions.

The water purification set is constructed for movement over rough terrain as well as smooth surfaced roads. Areas traveled are limited only by the capability of the truck upon which the water purification unit is mounted. Locate and set up water purification set in a layout similar to figure 2-25.

WARNING

Purify the best and cleanest water available. Avoid taking water located near a bathing area, sewer outlet, latrine, oily area, refuse pile, or camp drainage area.

Refer to paragraph 4-5 and follow installation instructions.

2-3. Controls and Instruments.

a. Valves and Cocks. Table 2-1 furnishes information pertaining to valves and cocks required for control and operation of the water purification unit. Figure 2-1 shows location of valves and cocks on a flow diagram. The following symbols are used to identify valves and cocks:

ARV — Air release valve

BPV — Bypass valve

CCV — Check valve

CV — Control valve

DC — Draincock

DV — Drain valve

FEI — Feed indicator

FLI — Float indicator

FV — Float valve

PI — Pressure indicator

SS — Safety switch

SG — Sight gage

VC — Vent cock

b. Raw Water Pressure Gage. The raw pressure gage (1, fig. 2-2) is mounted on aspirator manifold (2) above the erdlator tank and indicates raw water discharge pressure from the aspirators. The normal operating pressure is 10-15 psi. For further location of raw water pressure gage in the purification system, refer to PI-1, figure 2-1.

c. Influent Pressure Gage. The influent pressure gage (2, fig. 2-3) is mounted on the filtered water piping to the right of the diatomite filter assembly (1) and indicates influent water pressure delivered to the influent section of diatomite filter pump assembly. The normal operating pressure of influent pressure gage is 0-65 psi. For further location of influent pressure gage, refer to PI-2, figure 2-1.

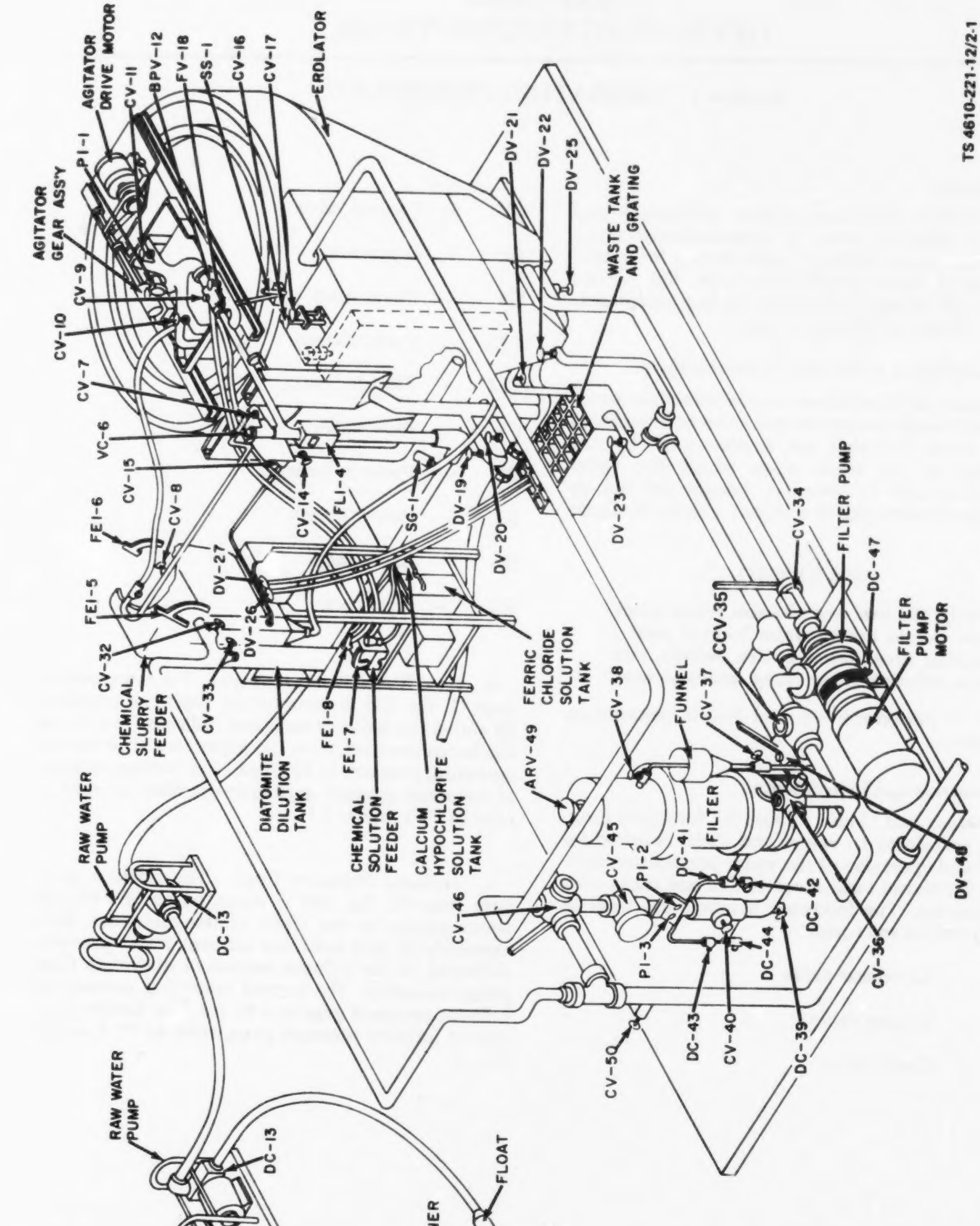
AGITATOR DRIVE MOTOR
AGITATOR GEAR ASS'Y
PI-1
CV-11
BPV-12
FV-18
SS-1
CV-16
CV-17
ERDLATOR
CV-9
CV-10
CV-7
VC-6
CV-15
CV-8
FEI-6
FEI-5
CV-32
CHEMICAL SLURRY FEEDER
CV-33
DV-26
DV-27
CV-14
FLI-4
SG-1
DV-19
DV-20
DV-21
DV-22
DV-25
WASTE TANK AND GRATING
DV-23
CV-34
FILTER PUMP
DC-47
FILTER PUMP MOTOR
CCV-35
FUNNEL
CV-37
CV-38
FERRIC CHLORIDE SOLUTION TANK
CALCIUM HYPOCHLORITE SOLUTION TANK
CHEMICAL SOLUTION FEEDER
FEI-7
FEI-8
DIATOMITE DILUTION TANK
RAW WATER PUMP
DC-13
ARV-49
FILTER
DC-41
CV-45
PI-2
CV-46
DC-42
DV-48
CV-36
DC-44
DC-39
CV-40
DC-43
PI-3
CV-50
RAW WATER PUMP
DC-13
FLOAT
STRAINER
SOURCE

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Figure 2-1. Flow Diagram

Table 2-1. Valves and Cocks

Symbol	Location	Function	Type & size	Start-up position	Normal operating position
VC-6	Raw water line to slurry feeder	Vents raw water line to assist complete drainage.	1/2 in. brass draincock used as vent.	Closed	Closed
CV-7	Raw water line to limestone slurry feeder compartment.	Controls flow of raw water used for dilution of limestone slurry.	1/2 in. gate valve.	Open	Partially open
CV-8	Raw water line to slurry feeder tank.	Control valve for filling limestone slurry tank.	1/2 in. gate valve.	Open	Closed
CV-9	Raw water to aspirator manifold	Main raw water influent valve for filling erdlator tank.	2 in. gate valve.	Partially open	Partially open
CV-10	Raw water influent line to aspirators	Controls flow of raw water to aspirators.	1 1/2 in. gate valve.	Open	Open
CV-11	Raw water influent line to aspirators	Controls flow of raw water to aspirators.	1 1/2 in. gate valve.	Open	Open
BPV-12	Raw water level alarm piping	Controls raw water rate of flow to erdlator tank.	1 1/2 in. gate valve.	Partially open	Partially open
DC-13	Raw water pump	Drains pump	1/8 in. brass drain cock	Closed	Closed
CV-14	Coagulated water line from slurry takeoff weir box to sludge concentrator tank	Permits drainage of sludge	1 1/2 in. gate valve	Closed	Open
CV-15	Coagulated water line from erdlator tank to diatomite dilution tank	Supplies coagulated water for mixing chemicals.	1/2 in. angle valve.	Closed	Closed
CV-16	False bottom of the sludge concentrator tank	Controls waste water sludge drawoff without loss of clear water.	Orifice plug valve (long pull rod).	Open	Open
CV-17	In sludge concentrator tank.	Controls flow of coagulated water to wet well tank.	Orifice plug valve (short threaded rod).	Partially open	Partially open
FV-18	Raw water level alarm assembly.	Controls water level in wet well tank.	1 1/2 in. float valve.	Closed	Closed
DV-19	Upper drain line from bottom of erdlator tank	Partially drains erdlator tank for short shutdown.	2 in. gate valve.	Closed	Closed
DV-20	Lower drain line from bottom of erdlator tank	Drains erdlator tank completely.	2 in. gate valve.	Closed	Closed
DV-21	Drain line from sludge concentrator tank	Controls the amount of sludge drawoff, drains sludge concentrator tank.	1 in. gate valve.	Closed	Partially open

Table 2-1. Valves and Cocks (Cont)

Symbol	Location	Function	Type & size	Start-up position	Normal operating position
DV-22	Drain line from sludge concentrator tank	Drains sludge concentrator tank completely.	1 in. gate valve.	Closed	Closed
DV-23	Drain line from waste tank	Drains waste tank.	1 in. gate valve.	Open	Open
DV-25	Drain water line from wet well tank	Drains wet well tank.	2 in. gate valve.	Open	Closed
DV-26	Drain line from chemical slurry feeder tank	Drains diatomaceous earth slurry compartment.	3/4 in. gate valve.	Closed	Closed
DV-27	Drain line from chemical slurry feeder tank	Drains limestone slurry compartment	3/4 in. gate valve.	Closed	Closed
CV-32	Filter water effluent line	Controls flow of filtered water to slurry feeder tank diatomaceous earth compartment.	1/2 in. gate valve.	Closed	Closed
CV-33	Slurry feeder filtered water line	Supplies filtered water for mixing chemicals.	1/2 in. angle globe valve.	Closed	Closed
CV-34	Coagulated water line to suction side of water pump	Controls flow of coagulated water to filter pump.	1 1/2 in. quick acting gate valve.	Closed	Open
CV-35	Coagulated water line from filter pump to influent plug valve.	Prevents backward flow of water from filter.	1 1/4 in. swing check	Closed	Open
CV-36	Coagulated water line from filter pump to influent plug valve	Controls flow of coagulated water for filtering or washing.	1 1/2 in., 3-way, plug valve, 2-port, 90° turn.	Open to F (filter)	Open to F (filter)
CV-37	Coagulated water line below precoat funnel	Diatomite slurry filling control valve to filter.	3/4 in. gate valve.	Open	Closed
CV-38	Air vent line on influent side of filter	Filter air vent.	3/8 in. gate valve.	Open	Closed
DC-39	Recirculation filter line below gate valve CV-40	Drains recirculation filtered water line.	1/4 in. draincock.	Closed	Closed
CV-40	Recirculation filter line below flow controller valve CV-45.	Starts and stops flow of water from filter.	1 1/2 in. gate valve.	Closed	Open
DC-41	Influent filter pressure gage line	Cuts off water pressure to influent gage.	1/4 in. brass draincock.	Closed	Open
DC-42	Influent filter pressure gage line	Drains filter influent gage and piping.	1/8 in. brass draincock.	Closed	Closed

Table 2-1. Valves and Cocks (Cont)

Symbol	Location	Function	Type & size	Start-up position	Normal operating position
DC-34	Effluent filter pressure gage line	Cuts off water pressure to effluent gage.	1/4 in. brass draincock.	Closed	Open
DC-44	Effluent filter pressure gage line	Drains filter effluent gage and piping.	1/8 in. brass draincock.	Closed	Closed
CV-45	Recirculation filter line below effluent plug valve CV-46	Controls rate of flow of water through filter.	1 1/2 in. flow control valve.	Open and regulate	Open and regulate
CV-46	Recirculation filter line above flow controller valve CV-45	Controls direction of flow for recirculating or filtering.	1 1/2 in., 3-way, 3-port, 90° turn. Plug valve.	Open to R (Recirculate)	Open to F (Filter)
DC-47	Base of filter pump	Drains pump volute.	1/8 in. draincock.	Closed	Closed
DV-48	Drain line from bottom of filter	Drains waste from filter.	2 in. quick acting gate valve.	Closed	Closed
ARV-49	Top of filter	Releases air trapped in dome of filter and filter elements.	Air release valve.	Closed	Closed
CV-50	Filter water effluent	Controls flow to filtered water storage tanks.	1 1/2 in. gate valve.	Open	Open
SS-1	Top of erdlator wet well	Operates buzzer to warn operator when well is low	BZN-2RN tapped 1/2 in. NPT	Closed	Open
FEI-5	Left side of chemical slurry feeder	Regulates and indicates of diatomaceous earth slurry to the diatomite filter ass'y	0-100%	Closed	30 ppm
FEI-6	Right side of chemical slurry feeder	Regulates and indicates flow of limestone slurry to erdlator tank	0-100%	Closed	50 ppm
FEI-7	Left side of chemical solution feeder	Regulates and indicates flow of calcium hypochlorite to erdlator tank	0-6 gph	Closed	30 ppm
FEI-8	Right side of chemical solution feeder	Regulates and indicates flow of ferric chloride solution to erdlator tank	0-6 gph	Closed	6 ppm
SG-1	Raw water line	Shows clarity of raw water	3/4-inch fitting		
FLI-4	Raw water line	Indicates flow rate of raw water	1 1/2 inch rotameter		20-30 gpm
PI-1	Aspirator manifold above erdlator	Indicates raw water pressure from aspirator	0-30 psi	15psi	10-15 psi

Table 2-1. Valves and Cocks (Cont)

Symbol	Location	Function	Type & size	Start-up position	Normal operating position
PI-2	Filtered water piping	Indicates influent water pressure to filter	0-100 psi		0-65 psi
PI-3	Filtered water piping	Indicates effluent water pressure from filter	0-100 psi		0-65 psi

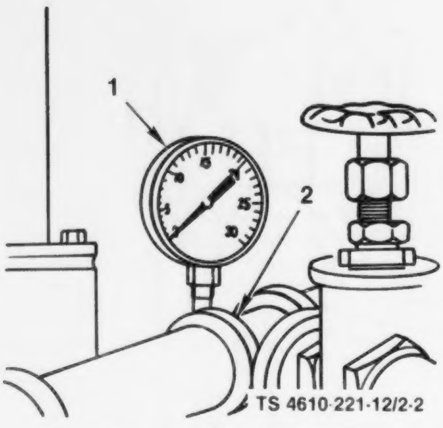


Figure 2-2. Raw Water Pressure Gage

Legend for figure 2-2:

1. Raw water pressure gage (PI-1)
2. Aspirator manifold

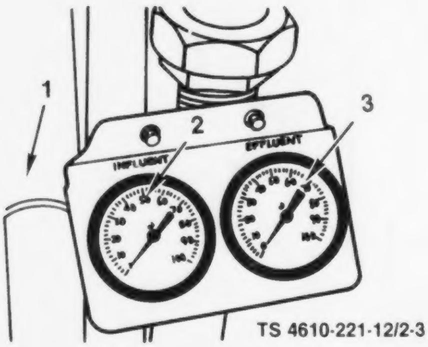


Figure 2-3. Influent and Effluent pressure Gage

Legend for figure 2-3:

1. Diatomite filter assembly
2. Influent pressure gage (PI-2)
3. Effluent pressure gage (PI-3)

d. Effluent Pressure Gage. The effluent gage (3, fig. 2-3) is mounted to the right of the influent pressure gage (2) on filtered water piping and indicates effluent water pressure delivered by diatomite filter assembly. The normal operating pressure of effluent pressure gage is 0-65 psi. For further location of effluent pressure gage, refer to PI-3, figure 2-1.

e. Rate of Flow Indicator. The rate of flow indicator (3, fig. 2-4) is mounted on wet well tank (4) and indicates gallons per minute of raw water flowing to erdlator tank. The rate of flow indicator (3, fig. 2-5) is located in raw water piping line along side of sludge concentrator tank (4) on unit serial numbers 816-1083. The normal operating flow of the rate of flow indicator is 20-30 gpm. For further location of the rate of flow indicator, refer to FLI-4, figure 2-1.

f. Diatomite Slurry Feed Variator. The diatomite slurry feed variator (3, fig. 2-6) is mounted on the left side of slurry feeder assembly (4) and regulates the flow of diatomaceous earth slurry to diatomite filter assembly. The normal diatomite slurry feed variator setting is 30 ppm (parts per million). For further location of the diatomite slurry feed variator, refer to FEI-5, figure 2-1.

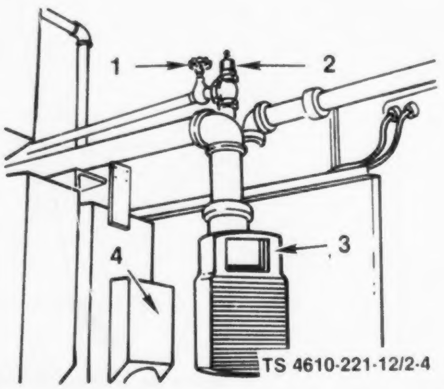
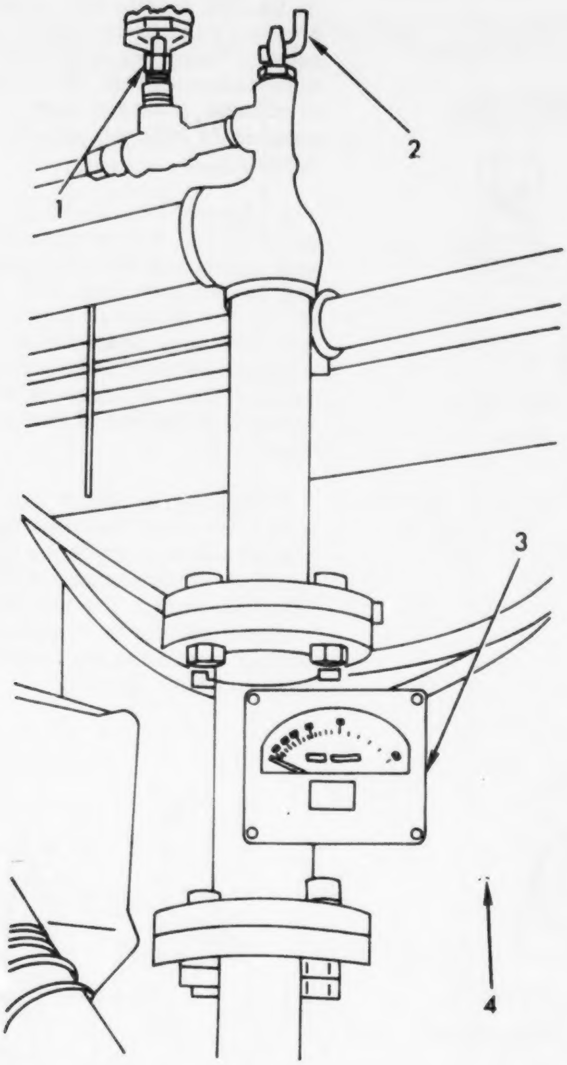


Figure 2-4. Rate of Flow Indicator (All Units Except 816-1083)

Legend for figure 2-4:

1. Control valve (CV-7)
2. Vent cock (VC-6)
3. Rate of flow indicator
4. Wet well tank



TS 4610-221-12/2-5

Figure 2-5. Rate of Flow Indicator (Unit Serial Numbers 816-1083)

Legend for figure 2-5:

1. Control valve (CV-7)
2. Vent cock (VC-6)
3. Rate of flow indicator
4. Sludge concentrator tank

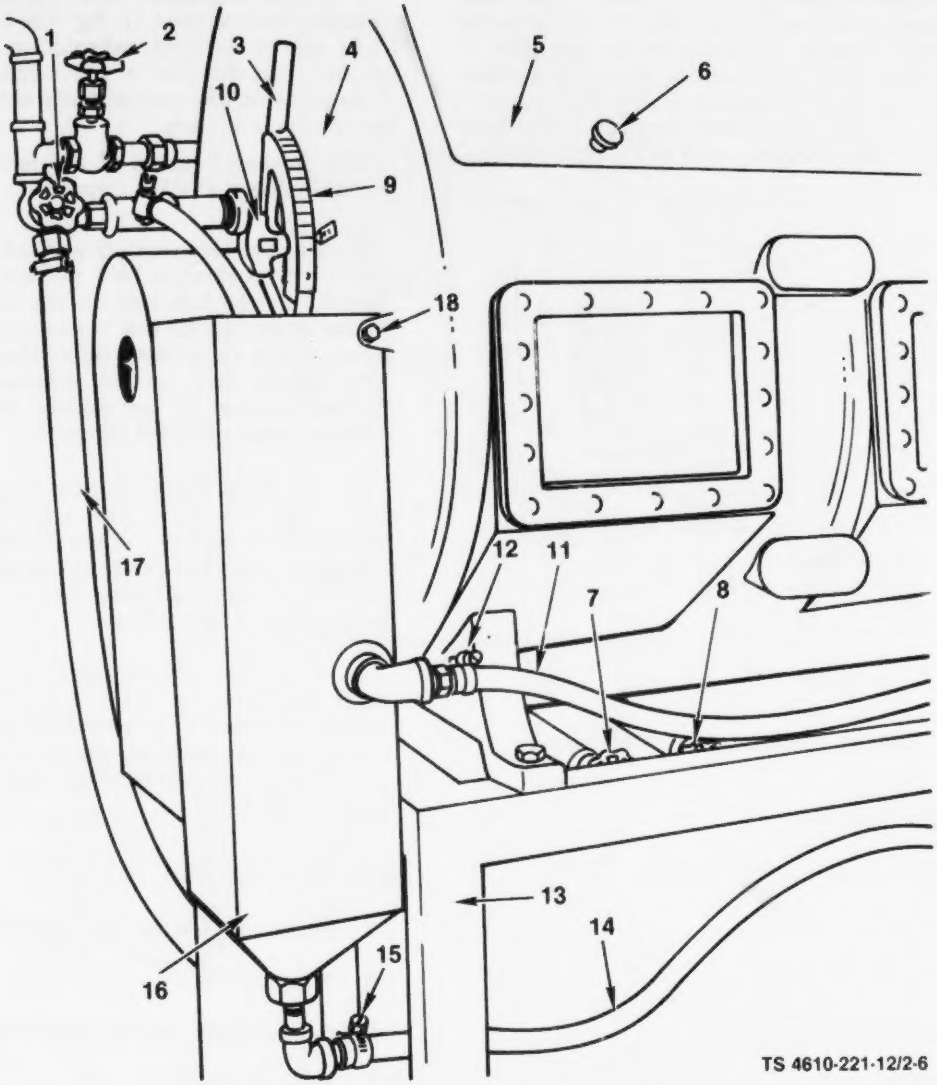


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Figure 2-6. Diatomite Slurry Feed Variator and Hoses

Legend for figure 2-6:

1. Ccontrol valve (CV-35)
2. Control valve (CV-32)
3. Diatomite slurry feed variator (FEI-5)
4. Slurry feed assembly
5. Charging door
6. Latch (2)
7. Drain valve (DV-26)
8. Drain valve (DV-27)
9. Variator scale
10. Locking knob
11. Plastic tube
12. Hose clamp
13. Slurry feeder frame
14. Plastic tube
15. Hose clamp
16. Diatomite dilution tank
17. Hose, 6 ft
18. Screw, cap, 1/4-20 x 1-1/4 inch (3)

g. Limestone Slurry Feed Variator. The limestone slurry feed variator (1, fig. 2-7) is mounted on the right side of the slurry feeder assembly (7) and regulates flow of limestone slurry to erdlator tank. The normal limestone slurry feed variator setting is 50 ppm. For further location of the limestone slurry feed variator, refer to FEI-6, figure 2-1. 2-1.

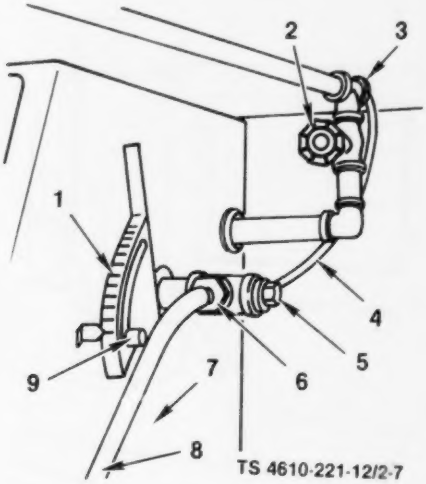


Figure 2-7. Limestone Slurry Feed Variator

Legend for figure 2-7:

1. Limestone slurry feed variator (FEI-6)
2. Control valve (CV-8)
3. Nut, tube 3/8 in. (2)
4. Copper tube
5. Ejector
6. Bushing, pipe, 1/2 x 1 in.
7. Slurry feeder assembly
8. Plastic tube
9. Knob, locking

h. Ferric Chloride Feed Variator. The ferric chloride feed variator (1, fig. 2-8) is located on the right side of the chemical solution feeder assembly (8) and regulates flow of ferric chloride solution to erdlator tank. The normal ferric chloride feed variator setting is 30 ppm.

For further location of the ferric chloride feed variator, refer to FEI-7, figure 2-1.

i. Calcium Hypochlorite Feed Variator. The calcium hypochlorite feed variator (3, fig. 2-8) is located on the left side of the chemical solution feeder assembly (8) and regulates flow of calcium hypochlorite to erdlator tank. The normal calcium hypochlorite feed variator setting is 6 ppm. For further location of the calcium hypochlorite feed variator, refer to FEI-8, figure 2-1.

j. Low Water Level Warning Buzzer and Indicator Light. The low water level indicator light (fig. 2-9) is located on control cabinet (4) and lights when a low water condition exists in wet well tank. The low water level warning buzzer sounds when low water level indicator light comes on.

k. Raw Water Sight Indicator. The raw water sight indicator (fig. 2-10) is located in raw water piping near point of entry to erdlator. The raw water clarity can be observed through the glass. For further location of the raw water sight indicator, refer to SG-1 (fig. 2-1).

Legend for figure 2-8:

1. Ferric chloride feed variator (FEI-7)
2. Wingnut (2)
3. Calcium hypochlorite feed variator (FEI-8)
4. Plastic tube (4)
5. Hose clamp (4)
6. Pump
7. Driving arm (2)
8. Chemical solution feeder assembly
9. Bolt, machine, 1/4-20 x 1-1/4 inch (4)
10. Slurry feeder frame

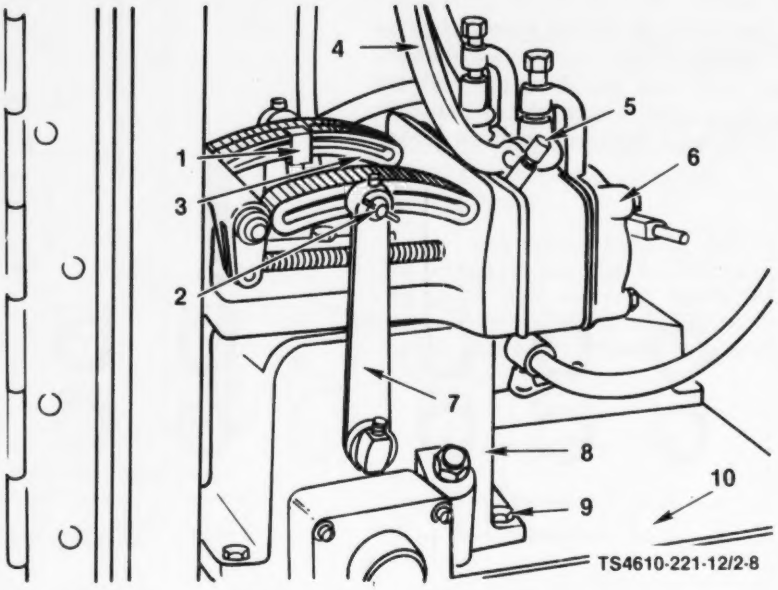
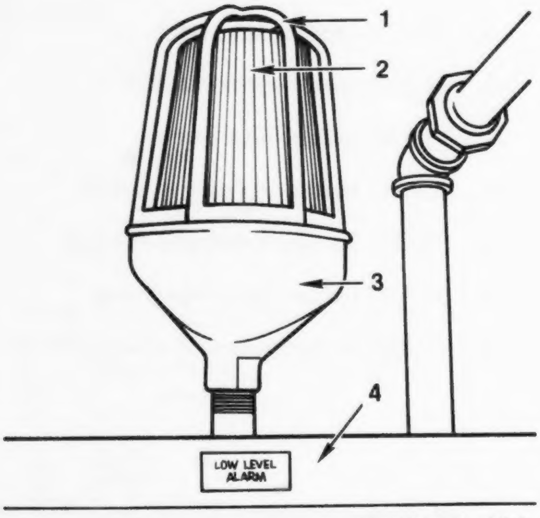

4
5
6
1
3
2
7
8
10
9
TS4610-221-12/2-8

Figure 2-8. Ferric Chloride and Calcium Hypochlorite Feed Variator


1
2
3
4
LOW LEVEL ALARM

TS 4610-221-12/2-9

Figure 2-9. Low water Level Indicator Light, Installed

Legend for figure 2-9:

1. **Guard**
2. **Globe**
3. **Base**
4. **Control cabinet**

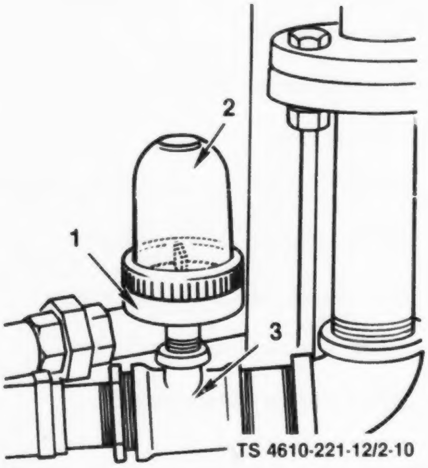

2
1
3
TS 4610-221-12/2-10

Figure 2-10. Raw Water Sight Indicator, Installed

Legend for figure 2-10:

1. **Raw water sight indicator (SG-1)**
2. **Glass**
3. **Raw water piping**

l. Switches.

(1) Chemical solution feeder START and STOP buttons. The chemical solution feeder START button (15, fig. 2-11) and STOP button (4) are located on the front of the control cabinet door and control operation of chemical solution feeder.

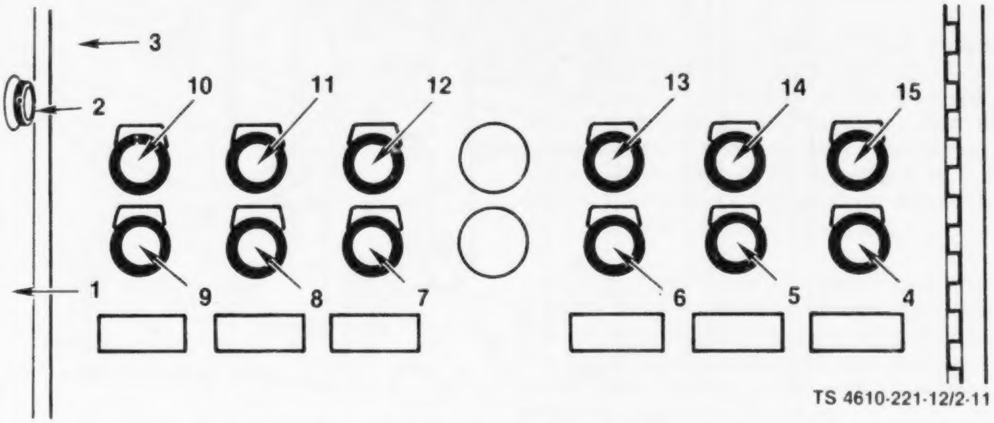


Figure 2-11. Control Cabinet START-STOP Buttons

Legend for figure 2-11:

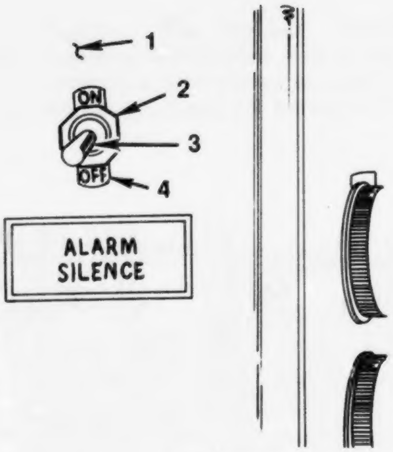
1. Control cabinet
2. Warning buzzer switch
3. Cabinet door
4. STOP button (chemical solution feeder)
5. STOP button (raw water pump)
6. STOP button (distribution pump)
7. STOP button (erdlator agitator)
8. STOP button (filter pump)
9. STOP button (slurry feeder)
10. START button (slurry feeder)
11. START button (filter pump)
12. START button (erdlator agitator)
13. START button (distribution pump)
14. START button (raw water pump)
15. START button (chemical solution feeder)

(2) Raw water pump START and STOP buttons. The raw water pump START button (14) and STOP button (5) are located on the front of the control cabinet door and control operation of raw water pump.

(3) Distribution pump START and STOP buttons. The distribution pump START button (13) and STOP button (6) are located on the front of control cabinet door and control operation of distribution pump.

(4) Erdlator agitator START and STOP buttons. The erdlator agitator START button (12) and STOP button (7) are located on the front of the control cabinet door and control operation of erdlator agitator motor assembly.

(5) Filter pump START and STOP buttons. The filter pump START button (11) and STOP button (8) are located on the front of the control cabinet door and control operation of filter pump motor assembly.



TS 4610-221-12/2-12

Figure 2-12. Warning Buzzer Toggle Switch

Legend for figure 2-12:

1. Control cabinet.
2. Nut (spec)
3. Toggle switch
4. Instruction plate

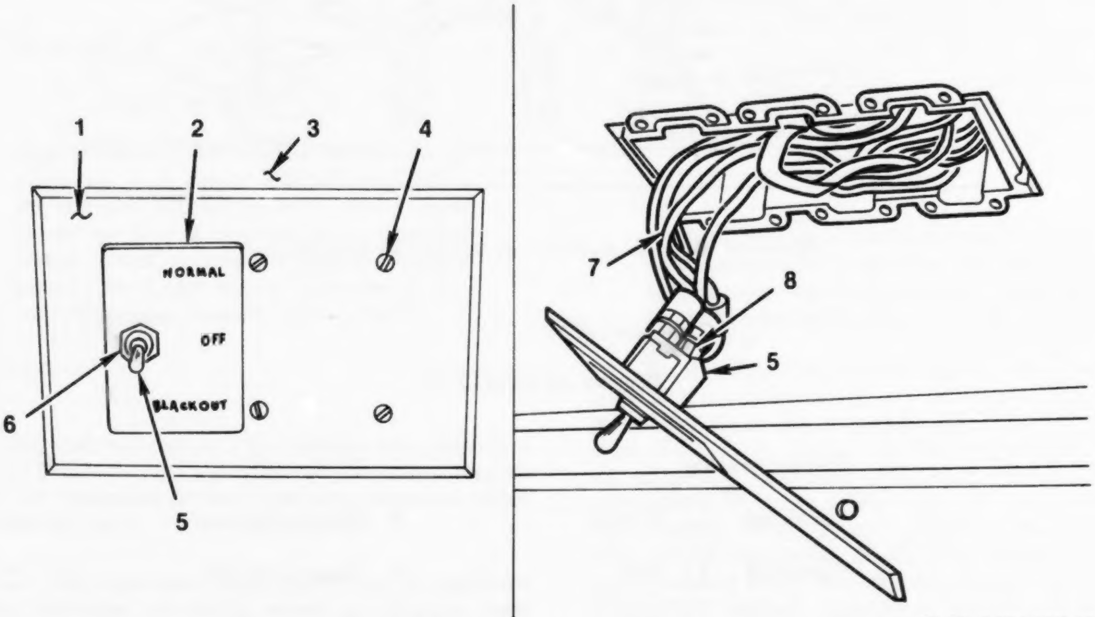
(6) Slurry feeder START and STOP buttons. The slurry feeder START button (10) and STOP button (9) are located on the front of the control cabinet doors and control operation of slurry feeder assembly.

(7) Toggle switch. The toggle switch (3, fig. 2-12) is located on the left side of the control cabinet (1) and permits operator to turn off low water level warning buzzer.

(8) Van ceiling lighting fixture toggle switch. The toggle switch (fig. 2-13) is mounted in the van ceiling by side entrance door. The toggle switch controls operation of van ceiling lighting fixtures during normal and blackout operation from a 120 volt power source.

Legend for figure 2-13:

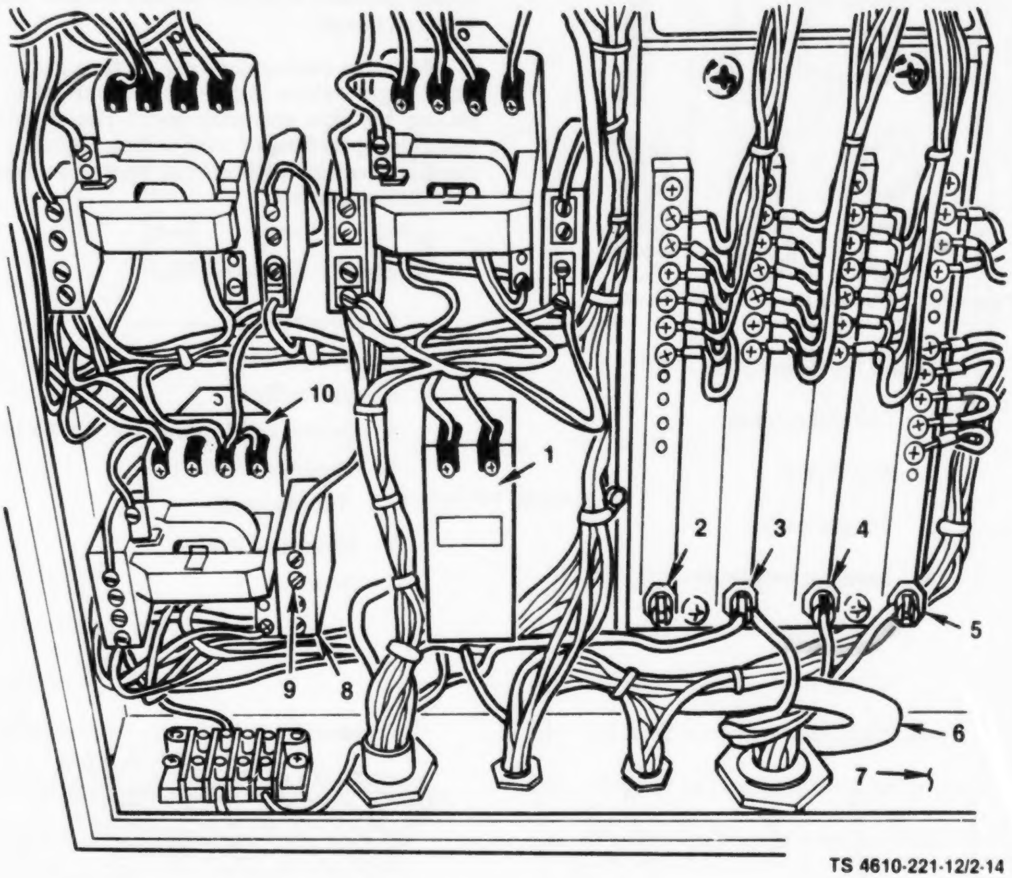
1. Cover plate
2. Nameplate
3. Van ceiling
4. Screw, self-tapping No. 8 x 1/2 in. (4)
5. Toggle switch (1)
6. Nut (spec) (1)
7. Electrical leads
8. Screw



TS 4610-221-12/2-13

Figure 2-13. Van Ceiling Lighting Fixtures Toggle Switch

(9) Circuit breaker. The circuit breaker (1, fig. 2-14) is located inside control cabinet (7). The left side of the circuit breaker protects personnel heater electrical system from shorts, grounds, and overloads. The right side of the circuit breaker protects the 110 volt van body lighting system.



TS 4610-221-12/2-14

Figure 2-14. Terminal Board, Circuit Breaker, and Motor Starter

Legend for figure 2-14:

1. Circuit breaker
2. Terminal L1 Black
3. Terminal L2 Red
4. Terminal L3 White
5. Terminal L0 Green
6. Power cable
7. Control cabinet
8. Reset level (10)
9. Overload (10)
10. Motor starter (5)

m. Heat Register. The two heat registers (1, fig. 2-15) are mounted in the front wall of van body (2). The heat registers provide adjustment of the direction of hot air produced by personnel heater.

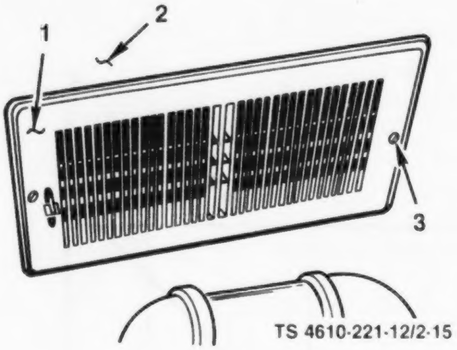


Figure 2-15. Heat Registers

Legend for figure 2-15:

1. Heat register (2)
2. Van body
3. Screw, thd-forming (No. 8 x 1-1/2 inc.) (2)

2-4. Starting.

NOTE

Piping, valves, etc, should be flushed by operating unit for 10 minutes and allowing effluent filtered water to go to waste whenever unit is returned from organizational, direct, or general support maintenance. This is to ensure removal of any solvent residue remaining in system.

a. General.

(1) Instructions in this section are published for information and guidance of personnel responsible for operation of van-type body mounted water purification unit.

(2) The operator must know how to perform every operation of which water purification unit is capable. This section gives instructions on starting and stopping unit, basic motions of unit, and on coordinating basic motions to perform specific tasks for which equipment is desgined. Since nearly every job presents a different problem, operator may have to vary given procedures to fit individual job.

b. Chemical Requirements and Preparation.

WARNING
DANGEROUS CHEMICALS

Accidental mixing of calcium hypochlorite and ferric chloride will produce chlorine gas. Chlorine gas is an irritant to respiratory tract, which can cause tracheobronchitis, pulmonary edema, and in sufficient concentration can lead to death. Do not mix dry calcium hypochlorite and activated carbon together. They react violently, causing fire and explosion.

(1) General. The chemicals required in treatment and filtration processes are ferric chloride as a coagulant, calcium hypochlorite as a disinfectant, limestone as a coagulant aid, diatomaceous earth as a filter aid, and activated charcoal as an absorber to control objectionable tastes and odors. The chemicals are mixed proportionately with water in accordance with an established base charge.

NOTE

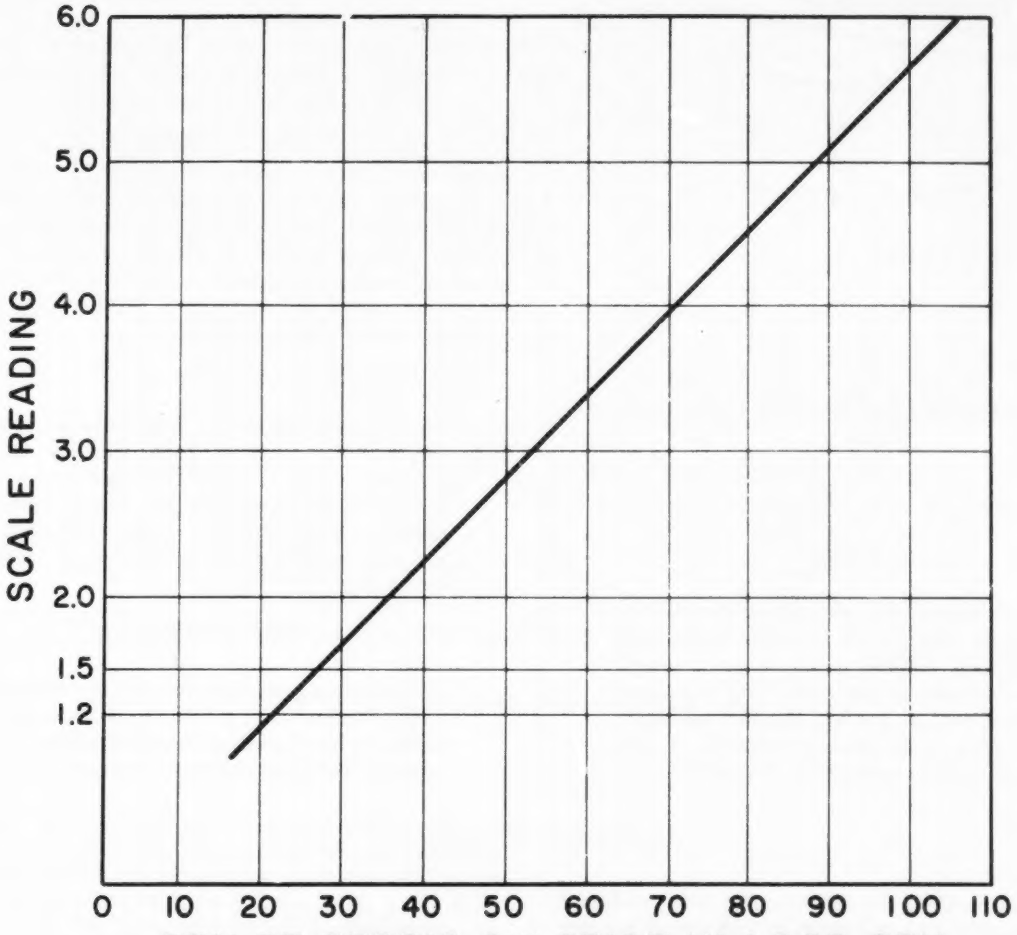
The base charge is the concentration of a mixture of solution expressed as the amount of chemical in a measured quantity of water, prepared for slurry feeder and chemical solution feeder and to be proportioned or pumped into water to be treated.

WARNING

Protect eyes and skin from direct contact with chemicals and solutions. Be especially careful when opening chemical containers to avoid inhaling chemical powder.

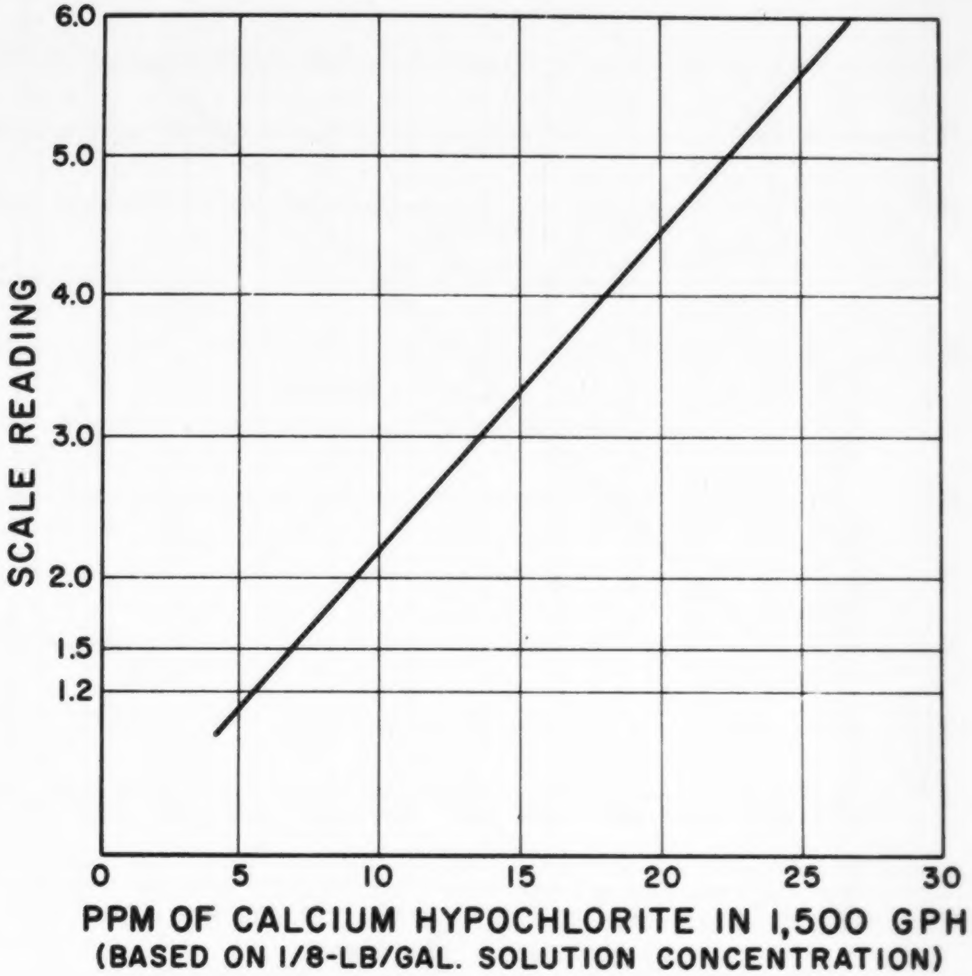
(2) Reading Calibration Charts. The chemical solutions are introduced into raw water and diatomite filter assembly as graphically shown in figures 2-16, 2-17, 2-18, and 2-19. The calibration charts are expressed vertically as SCALE READING and correspond to scale calibrations of ferric chloride feed variator FEI-7, calcium hypochlorite feed variator FEI-8, diatomite slurry feed variator FEI-5, and limestone slurry feed variator FEI-6. The SCALE READING reflects number of gallons of solution or slurry introduced into raw water or diatomite filter assembly per hour. The first horizontal scale

on calibration charts (except for figures 2-16 and 2-17) is graduated in ml/min (milliliters per minute) and expresses milliliters of chemical introduced into raw water per minute. The second horizontal scale (only horizontal scale or figure 2-16 and 2-17) on calibration charts is graduated in ppm (parts per million) and expresses parts of chemical introduced into a million parts of raw water. The recommended chemical feed dosages throughout this section are expressed in ppm. Read calibration charts by locating specified ppm of chemical on horizontal scale, trace a vertical line up to meet curve, and trace a line horizontally to SCALE READING on left. Adjust feed variators to number corresponding to the SCALE READING.



TS 4610-221-12/2-16

Figure 2-16. Ferric Chloride Solution Calibration Chart



TS 4610-221-12/2-17

Figure 2-17. Calcium Hypochlorite Solution Calibration Chart

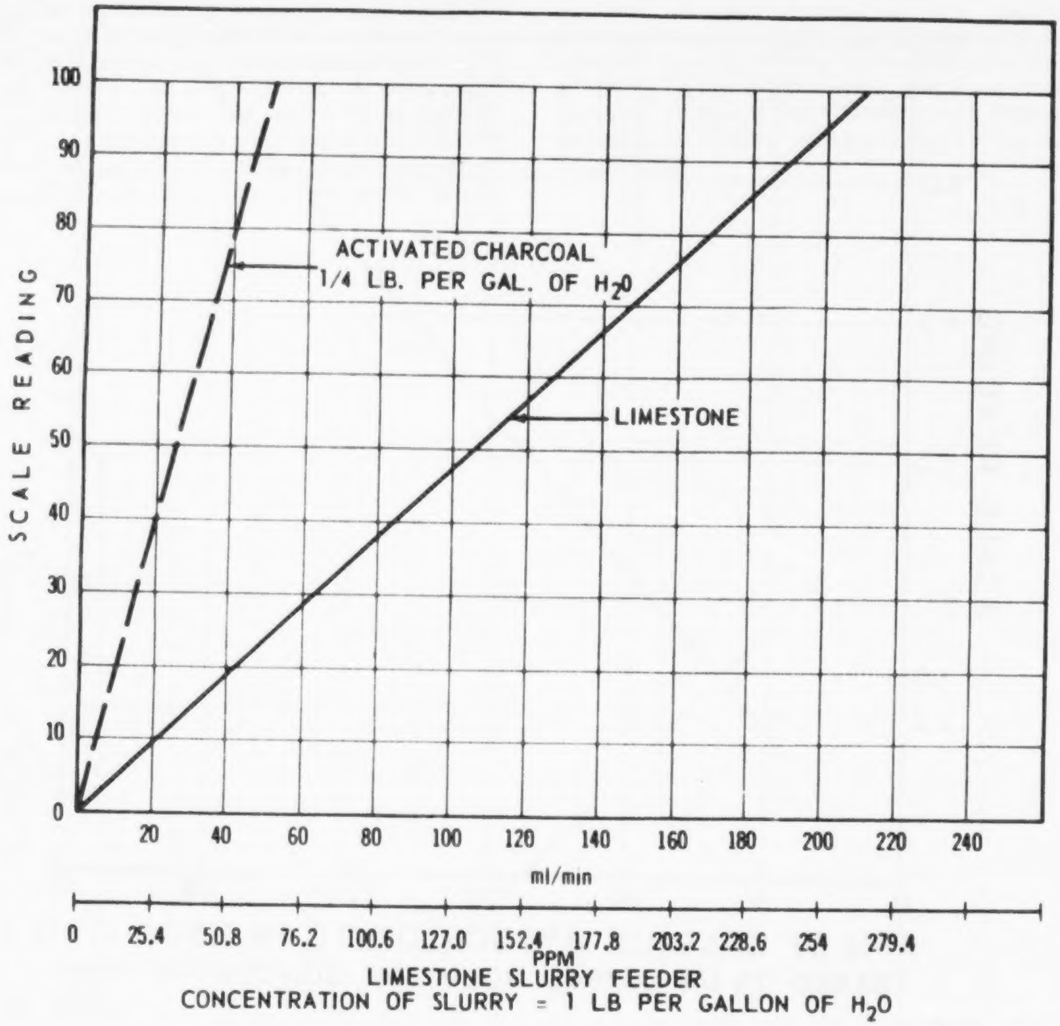
(3) Ferric Chloride Solution.

(a) Base charge. The base charge for ferric chloride solution is one pound (454 g) of ferric chloride per two gallons (7.6 liters) of raw water.

(b) Preparation of ferric chloride solution.

1. Empty contents of one pound (454 g) plastic bag of ferric chloride (item 6, App. E) into a rubber pail.

2. Slowly fill pail to two gallon (7.6 liter) mark with raw water while stirring to dissolve chemical.



TS 4610-221-12/2-18

Figure 2-18. Linestone Slurry and Activated Charcoal Calibration Chart

(c) Initial charging.

1. Remove nut (2, fig. 2-20), washer (3), clamp arm (4), and tank covers (1).

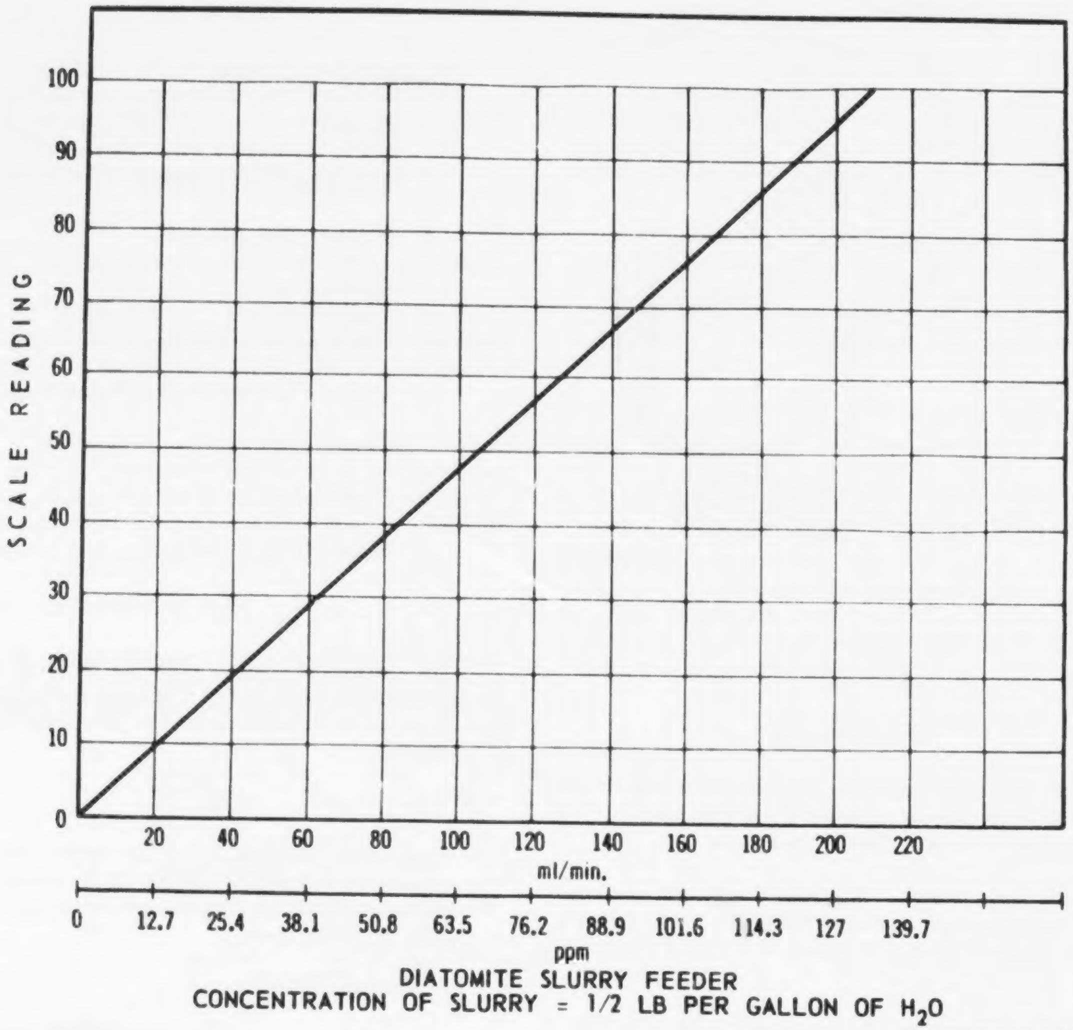
WARNING

Be careful when pouring chemical solutions into solution tanks. Chemicals splashed on skin and eyes will cause irritation.

2. Slowly pour ferric chloride solution from rubber pail into ferric chloride solution tank (5).

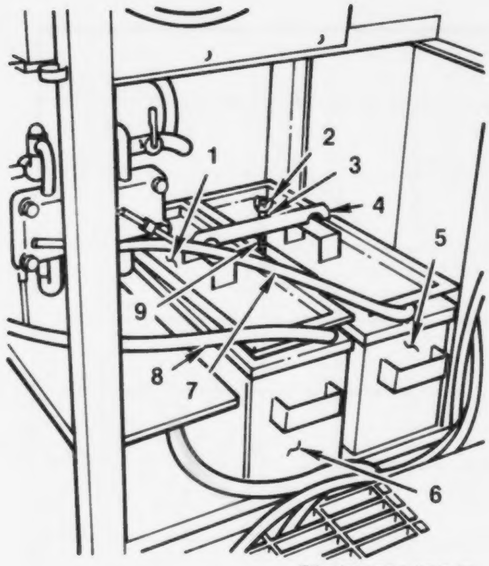
3. Place plastic tube (7) in ferric chloride solution tank. Check strainer on end of plastic tube. Clean if required.

4. Install tank covers (1) and secure with clamp arm (4), washer (3), and nut (2). Be careful not to crush plastic tube.



TS 4610-221-12/2-19

Figure 2-19. Diatomaceous Earth Slurry Calibration Chart



TS 4610-221-12/2-20

Figure 2-20. Chemical Solution Tanks

Legend for figure 2-20:

1. Cover
2. Nut, plain, wing, 1/2-13
3. Washer, flat, 1/2 inch
4. Clamp arm
5. Ferric chloride solution tank
6. Calcium hypochlorite solution tank
7. Plastic tube
8. Plastic tube
9. Stud, 1/2-13 x 15 in.

(4) Calcium Hypochlorite Solution.

WARNING

Do not mix calcium hypochlorite and activated carbon together. They may react violently causing fire or explosion.

(a) Base charge. The base charge for calcium hypochlorite solution is one-eighth pound (57 g) of calcium hypochlorite per gallon (3.8 liters) of raw water.

(b) Preparation of calcium hypochlorite solution.

1. Measure three-eighths pound (170 g) of calcium hypochlorite (item 4, App. E) and pour into a rubber pail.

NOTE

A plastic measure, which is a component of water purification set, is provided for measuring the calcium hypochlorite. This measure is graduated from 1/4 to 1-1/4 pounds in 1/4 pound increments (113 g to 567 g in 113 g increments).

2. Slowly fill pail to three gallon (11.4 liter) mark with raw water while stirring with paddle furnished to dissolve chemical.

(c) Initial charging. Charge calcium hypochlorite solution tank (6, fig. 2-20) and install plastic tube (8) in same manner described in subparagraph (c) 3. above.

NOTE

Approximately 30% of calcium hypochlorite is inert and will settle to bottom of pail. Be sure all calcium hypochlorite is emptied from pail into tank.

(5) Limestone Slurry.

(a) Base charge. The base charge for limestone slurry is one pound (454 g) of limestone (item8, App. E) per gallon (3.8 liter) of raw water.

(b) Preparation and initial charging of limestone slurry. The limestone slurry is prepared and initially charged in right-hand compartment of slurry feeder tank when raw water is introduced into water purification system.

(6) Diatomite Slurry for Precoating.

(a) Base charge. The base charge for diatomite slurry is 1/2 pound (227 g) of diatomaceous earth (item 7, App. E) per gallon (3.8 liter) of coagulated water.

(b) Preparation and initial charging of diatomite slurry. The diatomite slurry for precoating is prepared after coagulated water has been produced in erdlator tank and is introduced into diatomite filter assembly through precoat funnel.

NOTE

Coagulated water may be obtained for precoating, preparing chemical solutions, or any general purpose from control valve CV-15 located on coagulated water line from erdlator tank to diatomite dilution tank.

(7) Diatomite Slurry for Slurry Feeder Assembly.

(a) Base charge. The base charge for diatomite slurry is 1/2 pound (227 g) of diatomaceous earth (item 7, App. E) per gallon (3.8 liter) of filtered water.

(b) Preparation and initial charging of diatomite slurry. The diatomite slurry is prepared and initially charged in left-hand compartment of slurry feeder assembly when filtered water is produced and available for mixing.

(8) Activated Charcoal.

(a) Base charge. The base charge of activated charcoal is 1/4 pound (113.5 g) of activated charcoal (item 5, App. E) per gallon (3.8 liters) of raw water in limestone compartment of slurry feeder assembly.

(b) Preparation and initial charging. When objectional taste or odor accompany filtered water, add 1.4 pounds (472 g) of activated charcoal to limestone compartment of slurry feeder assembly.

c. *Preliminary Valve Positioning.* Valves in water purification system must be positioned correctly prior to starting water purification unit. All draincocks, vent cocks, and liquid level cocks tabulated in table 2-1 must be closed prior to starting water purification unit.

(1) Open drain valve DV-25 (3, fig. 2-21) in waste water line that drains wet well tank (2).

(2) Close drain valves DV-19 (9) and DC-20 (8), located in waste water line, that drain erdlator tank (10).

(3) Close drain valves DV-21 (4, fig. 2-21) and DV-22 (4, fig. 2-22), located in waste water line, that drain sludge concentrator tank (3).

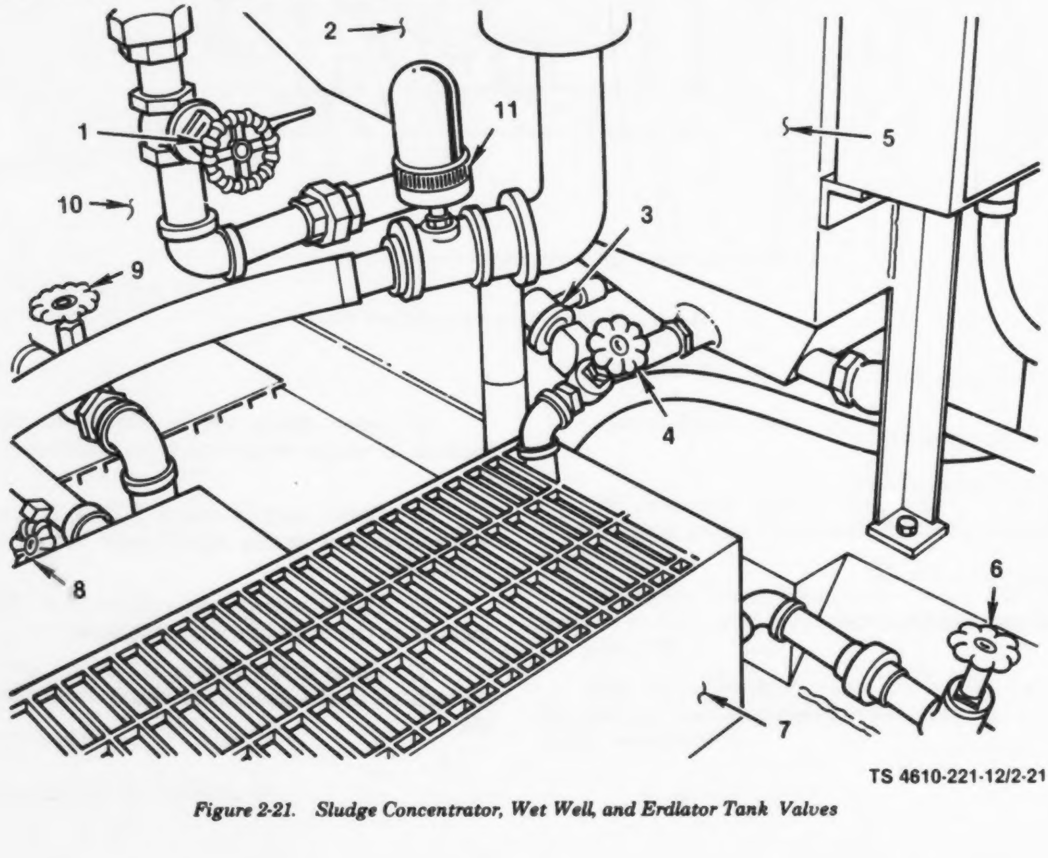


Figure 2-21. Sludge Concentrator, Wet Well, and Erdlator Tank Valves

Legend for figure 2-21:

1. Control valve (CV-14)
2. Wet well tank
3. Drain valve (DV-25)
4. Drain valve (DV-21)
5. Sludge concentrator tank
6. Drain valve (DV-23)
7. Waste water tank
8. Drain valve (DV-20)
9. Drain valve (DV-16)
10. Erdlator tank
11. Raw water sight indicator (SG-1)

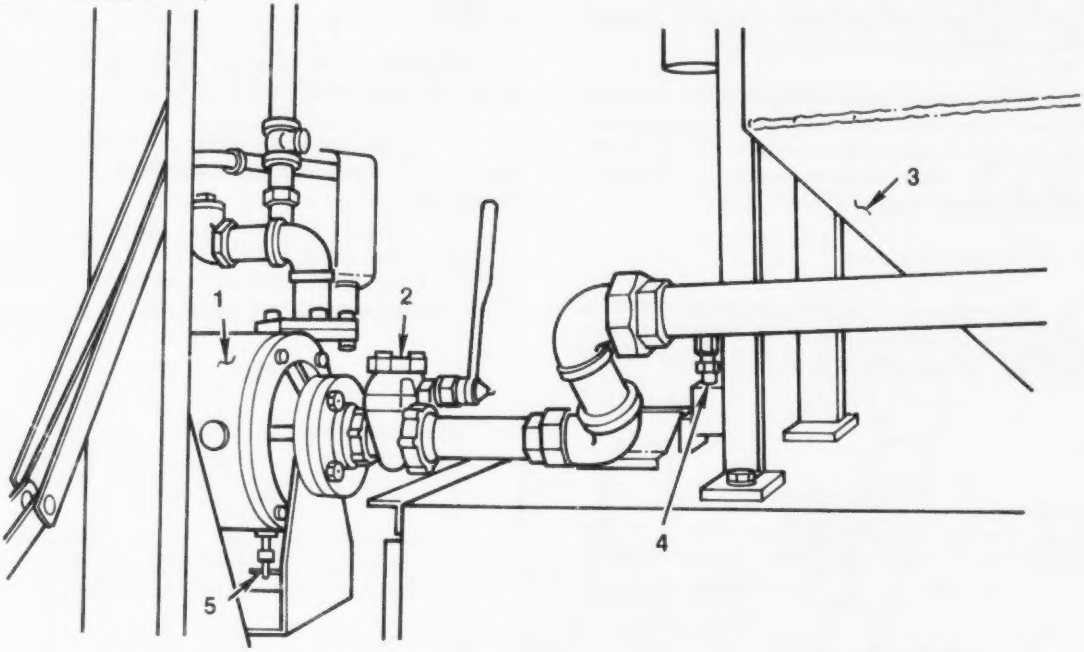


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Figure 2-22. Filter Pump Assembly and Valves

Legend for figure 2-22:

1. Filter pump assembly
2. Control valve (CV-34)
3. Sludge concentrator tank
4. Drain valve (DV-22)
5. Draincock (DC-47)

(4) Open drain valve DV-23 (6, fig. 2-21) located in waste water line from waste water tank (7).

(5) Close control valve CV-14 (1) in waste water line that drains slurry weir box of erdlator tank (10).

(6) Close control valve CV-15 (4, fig. 2-23) located on the front of erdlator tank (6).

(7) Close drain valves DV-26 (1) and DV-27 (2) located in the bottom of slurry feeder assembly (3).

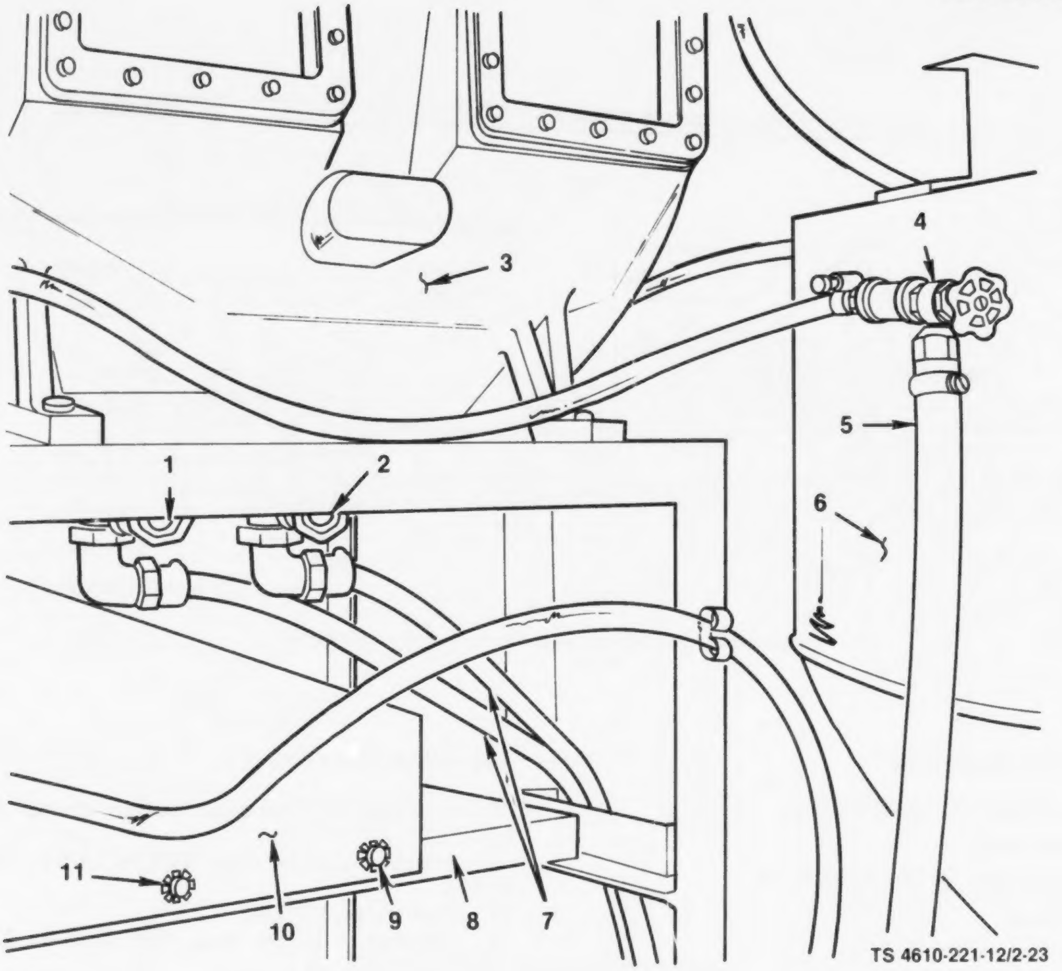


Figure 2-23. Slurry Feeder Assembly, Valves and Hoses

Legend for figure 2-23:

1. Drain valve (DV-26)
2. Drain valve (DV-27)
3. Slurry feeder assembly
4. Control valve (CV-15)
5. Hose, 6 ft
6. Erdlator tank
7. Tubing, 5 ft 6 in. (2)
8. Slurry feeder
9. Screw, cap, 1/4-20 x 3/4 in. (3)
10. Belt guard
11. Lockwasher, 1/4 in. (3)

(8) Partially open control valve CV-9 (5, fig. 2-24) located in the raw water piping above erdlator tank (10).

(9) Partially open bypass valve BPV-12 (7) located in the water level alarm piping above erdlator tank (10).

(10) Close control valve CV-34 (2, fig. 2-22) located in the coagulated water piping, to filter pump assembly (1).

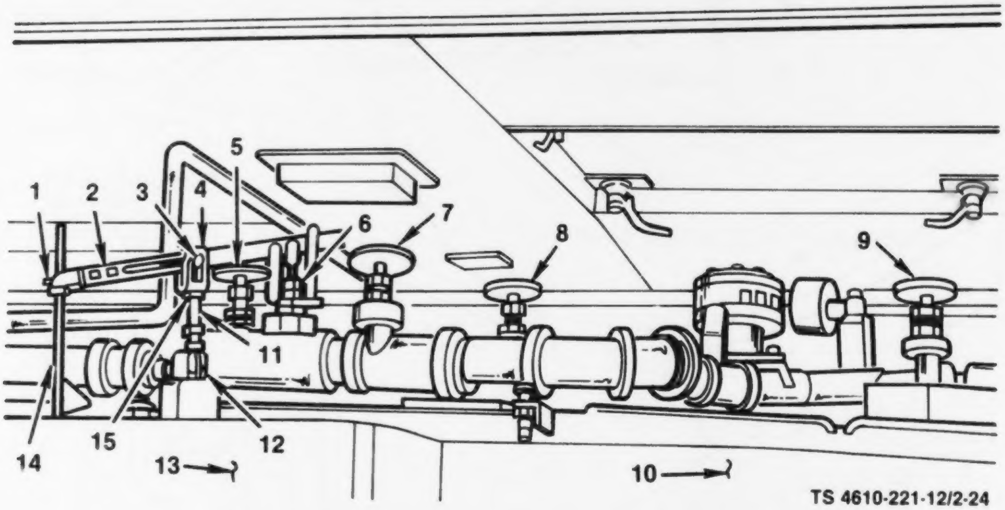


Figure 2-24. Low Water Level Alarm Assembly and Valves

Legend for figure 2-24:

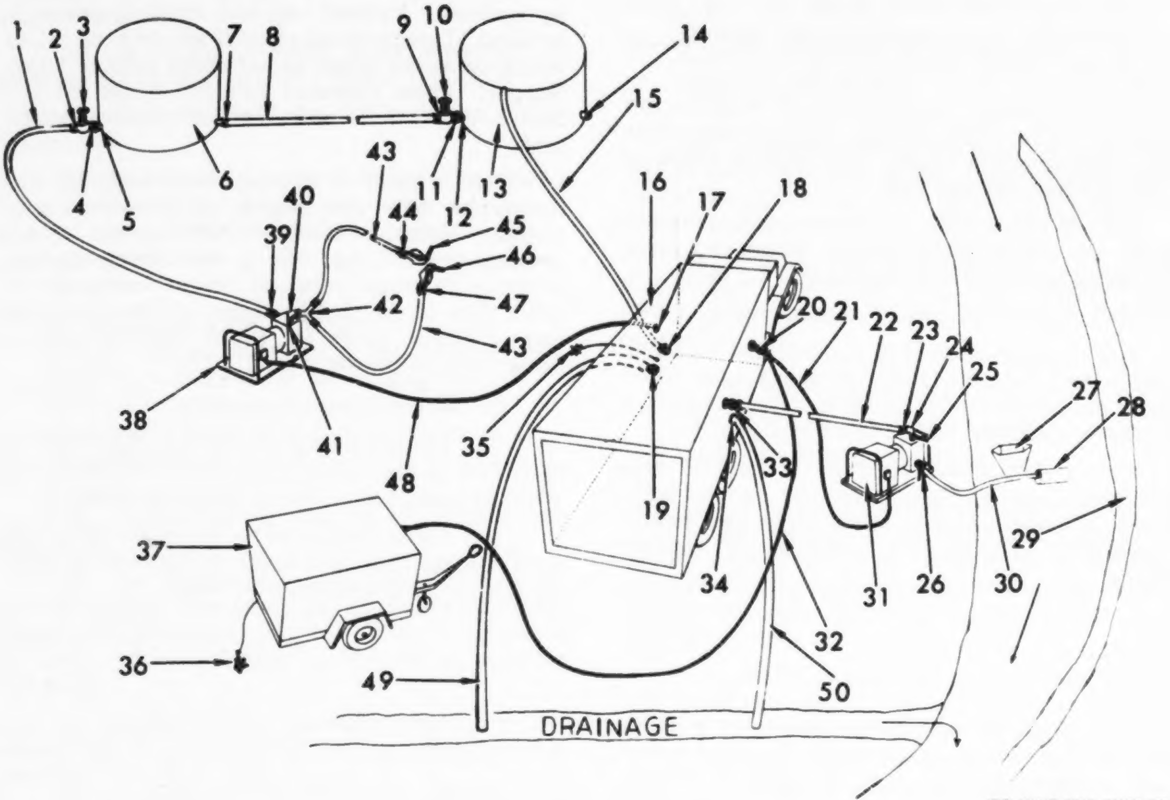
1. Thumbscrew, 1/4-20 x 1/2 in.
2. Float lever
3. Screw, cap, 1/4-20 x 1 1/4 in. (2)
4. Bracket
5. Control valve (CV-9)
6. Float valve (FV-18)
7. Bypass valve (BPV-12)
8. Control valve (CV-10)
9. Control valve (CV-11)
10. Erdlator tank
11. Screw, cap, 5/8-18 x 2 1/2 in.
12. Low water level sensitive switch (SS-1)
13. Wet well tank
14. Float rod
15. Nut, plain, hex, 5/8-18

d. Starting Water Treatment Section.

(1) Generator Set. Perform operator's daily services and start generator set (37, fig. 2-25) as described in applicable technical manual contained with equipment.

Legend for figure 2-25:

1. Storage tank-to-distribution pump hose, 1 1/2 in.
2. Adapter, 1 1/2 in. male NPT to 1 1/2 in. female NPSH
3. Gate valve, 1 1/2 in.
4. Adapter, 1 1/2 in. male NPT to 2 in. female NPSH
5. Male outlet second storage tank, 2 in. female NPSH
6. Second storage tank
7. Second storage tank female inlet, 2 in. NPSH
8. First storage tank-to-second storage tank hose, 2 in.
9. Adapter, 2 in. male NPT to 2 in. male NPSH
10. Gate valve, 2 in.
11. Adapter, 2 in. male NPT to 2 in. male NPSH
12. First storage tank female outlet, 2 in. NPSH
13. First storage tank
14. First storage tank female outlet, 2 in. NPSH
15. Storage tank hose, 1 1/2 in.
16. Van body
17. Cable outlet
18. Filtered water outlet
19. Waste outlet
20. Cable outlet
21. Electrical lead
22. Suction hose, 1 1/2 in.
23. Adapter, 1 1/2 in. male NPT to 1 1/2 in. female NPSH
24. Pipe elbow, 1 1/2 in., 90 degree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DRAINAGE

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Figure 2-25. Water Purification Set Layout

25. Pipe nipple, 1 1/2 in. x 1 3/4 in.
26. Adapter, 1 1/2 in. male NPT to 1 1/2 in. male NPSH
27. Float
28. Strainer, 1 1/2 in. female NPSH
29. Water supply source
30. Raw water pump suction hose, 1 1/2 in.
31. Raw water pump
32. Power cable
33. Van body raw water hose inlet
34. Waste water outlet
35. Ground rod and cable
36. Trailer ground rod and cable
37. Trailer mounted generator set
38. Filtered water distribution pump
39. Adapter, 1 1/2 in. male NPT to 1 1/2 in. male NPSH
40. Pipe elbow, 1 1/2 in. 90 degree
41. Pipe nipple, 1 1/2 in. x 1 3/4 in.
42. Siamese connection, single end, 1 1/2 in. male NPT, siamese end 1 1/2 in. female NPSH
43. Distribution pump discharge hose, 1 1/2 in.
44. Adapter, 1 1/2 in. male NPT to 1 1/2 in. male NPT
45. Nozzle, 1 1/2 in. female NPT
46. Nozzle, 1 1/2 in. female NPT
47. Adapter, 1 1/2 in. male NPT to 1 1/2 in. male NPT
48. Electrical lead
49. Waste water hose, 2 in.
50. Waste water hose, 2 in.

(2) Raw Water Pump.

(a) Prime raw water pump (31, fig. 2-25).

(b) Press raw water pump START button 14, fig. 2-11).

(c) If foreign material or air bubbles are observed in raw water passing through raw water sight indicator SG-1 (1, fig. 2-10), adjust depth of suction strainer (28, fig. 2-25).

(d) If two pumps are connected in series to deliver raw water, prime second pump and press distribution pump START button (13, fig. 2-11).

(3) Chemical Solution Feeder Assembly.

(a) Loosen wingnut (2, fig. 2-8) and set ferric chloride feed variator (1) for 30 ppm, equal to 50 ml/min dosage, as shown on ferric chloride solution calibration chart (fig. 2-16). Tighten wingnut.

(b) Loosen other wingnut (2, fig. 2-8) and set calcium hypochlorite feed variator (3) for 6 ppm, equal to 50 ml/min dosage, as shown on the calcium hypochlorite solution chart (fig. 2-17). Tighten wingnut.

(c) Before starting chemical solution feeder, check feeder gearbox for tight or hard turning gears by removing knurled cap and rotating gearshaft by hand. If gears do not move freely by hand (which would cause the motor to burn out), refer to Direct Support. Press chemical solution feeder START button (15, fig. 2-20) when raw water enters erdlator tank.

(d) If chemical solution feeder assembly does not prime after one minute of operation, press chemical solution feeder STOP button (4) and activate arms (7, fig. 2-8) up and down, manually priming chemical solution feeder assembly (8). After flow of chemical solution is observed in discharge plastic tubes (4), press chemical solution feeder START button (15, fig. 2-11).

(4) Slurry Feeder Assembly.

(a) Open control valve CV-7 (1, fig. 2-4 or 2-5) and DV-8 (2, fig. 2-7) and admit raw water to limestone compartment of slurry feeder assembly (7).

(b) Close control valve CV-8 (2) when water level reaches high level mark on liquid level indicator (12, fig. 2-26) inside slurry feeder.

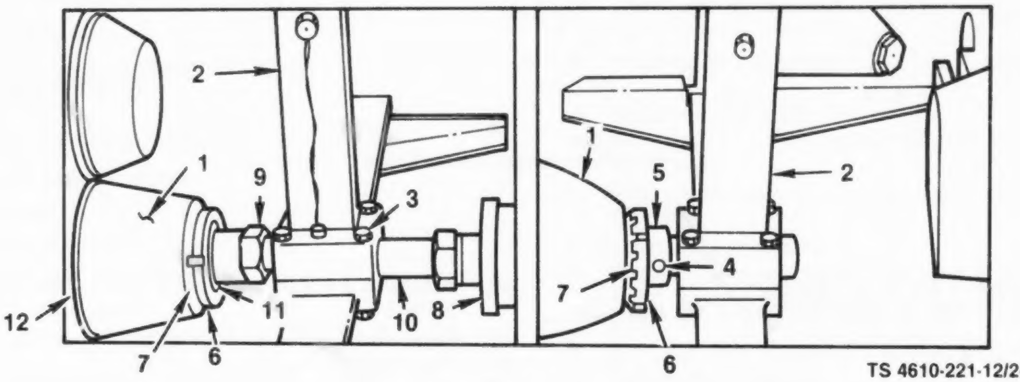

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Figure 2-26. Slurry Feeder Agitator, Removal

Legend for figure 2-26:

1. Bearing cage
2. Arm assembly (2)
3. Screw, cap, stainless steel, 3/8-16 x 2 1/2 in. (4)
4. Setscrew, 1/4-20 x 1/4 in.
5. Shaft collar
6. Locknut (spec) (2)
7. Washer (spec) (2)
8. Inner bearing
9. Nut, hex bronze, 1 5/8-18 (2)
10. Slurry feeder shaft
11. Outer bearing
12. Liquid level indicator

(c) Set limestone feed variator FEI-6 (1, fig. 2-7) at zero.

(d) Start slurry feeder motor assembly by pressing slurry feeder START button (10, fig. 2-11).

(e) Turn latches (6, fig. 2-6) and open charging door (5).

(f) Measure 14 pounds (6.36 kg) of limestone (item 8, App. E) and add it to limestone compartment of slurry feeder assembly (4). Allow slurry to be thoroughly mixed.

NOTE

An aluminum measure, which is a component of water purification set, is provided for measuring limestone. This measure is graduated from 1/2 to 5 1/2 pounds (227 to 2517 g) in increments of 1/2 pound (227 g).

(g) Close charging door (5) and secure with latches (6).

(h) Set limestone feed variator FEI-6 (1, fig. 2-7) for 50 ppm dosage as shown on the limestone slurry calibration chart (fig. 2-18). Refer to figure 2-5 for rate of flow indicator on unit serial numbers 815-1083.

(i) Adjust control valve CV-7 (1, fig. 2-4) to ensure proper flushing of limestone slurry to erdlator tank.

(5) Erdlator.

WARNING

The erdlator agitator has an unguarded V-belt drive. Prior to starting erdlator agitator motor, make sure all personnel are clear of the motor's V-belt. Remain clear when unit is in operation.

(a) Turn handwheel (9, fig. 2-35) clockwise to relieve tension on the V-belt (5). Refer to figure 2-5 for rate of flow indicator on unit serial numbers 815-1083.

(b) Loosen setscrew (1, fig. 2-35) in each of the two collars (19) and setscrew (3) in pulley (2).

(c) Move pulley (2) right or left until V-belt is horizontally aligned in pulley grooves.

(d) Tighten setscrew (3) in pulley (2) and setscrew (1) in each collar (19).

(e) Turn handwheel (9) counterclockwise until V-belt can be depressed only 1 inch at a point midway between the two pulleys.

(f) Start erdlator agitator motor assembly by pressing erdlator agitator START button (12, fig. 2-11).

CAUTION

Do not start erdlator motor assembly until there is at least one foot (31 cm) of water in erdlator tank.

(g) Manually lift float lever (2, fig. 2-24), closing float valve FV-18 (6). Adjust control valve CV-9 (5) until rate of flow indicator (3, fig. 2-26) reads 20 gpm.

(h) Release float lever (2, fig. 2-24), allowing float valve FV-18 (6) to open. Adjust bypass valve BPV-12 (7) until rate of flow indicator (3, fig. 2-26) reads 40 gpm.

WARNING

When leveling effluent launder, remain clear of erdlator agitator drive.

(i) When water in the erdlator tank (10, fig. 2-35) begins to overflow into effluent launder (13), level effluent launder by turning the three effluent launder leveling rods (15) until water is flowing uniformly through the entire circumference of the effluent launder.

(j) Add a base charge of one pound (454 g) of dry limestone (item 8, App. E) and one quart (9.95 liter) of ferric chloride solution (item 6, App. E) prepared for the chemical feeder to erdlator tank when it is first filled to accelerate formation of slurry blanket.

NOTE

The slurry blanket, sometimes called floc, is jelly-like curd formed following addition of the limestone slurry and ferric chloride solution to raw water as water is agitated. The jelly-like floc first appears as small particles which grow by adherence with other particles. As the water swirls, small particles join with others to enmesh most of suspended bacteria, dirt, and organic matter to form a visible slurry blanket.

(k) Open control valve CV-14 (1, fig. 2-21) in waste water piping from slurry weir box to permit excess slurry blanket to be drawn off sludge concentrator tank (5).

(l) Open plug control valve CV-16 (1, fig. 2-27) which permits slurry blanket, drawn off from erdlator tank, to enter outer quandrant of sludge concentrator tank (6).

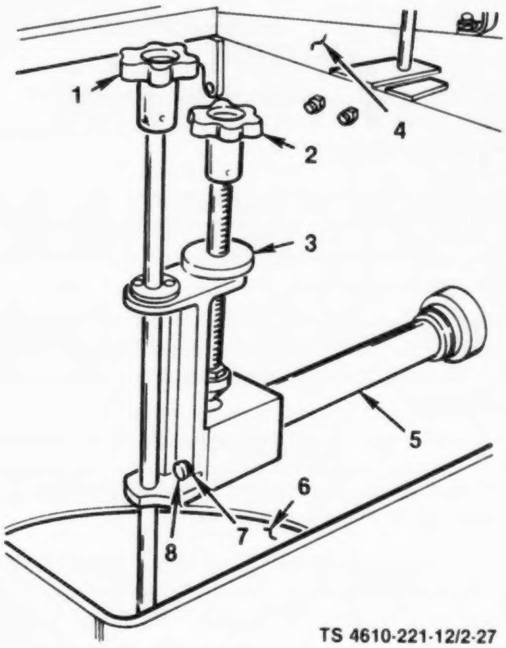

Figure 2-27. Sludge Concentrator Tank and Valves

Legend for figure 2-27:

1. Control valve (CV-16)
2. Control valve (CV-17)
3. Jamnut (spec)
4. Wet well tank
5. Drawoff piping
6. Sludge concentrator tank
7. Washer, lock, 1/4 in. (2)
8. Screw, cap, 1/4-20 x 1/2 in. (2)

(m) When clear water has been established in upper portion of sludge concentrator tank, loosen jamnut (3) and open drawoff plug control valve CV-17 (2) to allow clear water to flow through drawoff piping (5) to wet well tank (4). Tighten jamnut (3).

(n) Adjust chemical feed dosages as necessary to obtain satisfactory clarity characteristics of water in tip of erdlator tank (para 2-5 c.)

(o) If necessary, adjust speed of erdlator agitator to keep slurry blanket in rotation (para 2-5 b.).

(p) After coagulated water flowing from erdlator tank to wet tank is clear, close drain valve DV-25 (3, fig. 2-21) to allow wet tank (2) to fill with coagulated water.

NOTE

Coagulated water in wet well tank will overflow to waste through the overflow piping until the filter section is put into operation.

(q) Loosen thumbscrew (1, fig. 2-24) and move float rod (14) up or down until the float causes float valve FV-18 (6) to close when water in wet well tank (13) is 10 inches (25 cm) below top of tank.

(r) Loosen wingnuts on the two capscrews (3) and move bracket (4) over sensitive switch (12). Tighten wingnuts.

(s) Push float lever (2) down, opening float valve FV-18 (6). Loosen nut (15) and move capscrew (11) down until it makes contact with sensitive switch plunger. Turn capscrew one turn further and tighten nut (15).

(t) Turn warning buzzer toggle switch (3, fig. 2-13) to ON.

e. *Starting Filter Section.*

WARNING

Do not pressurize filter section without first ensuring that filter housing clamp assembly and gasket are properly seated and tightened.

(1) *Precoating diatomite filter assembly.*

(a) Open drain valve DV-48 (2, fig. 2-28 or 2-29) located on waste water piping from the bottom of the diatomite filter assembly (1) to allow any water within filter to be drained.

Legend for figure 2-28:

1. Diatomite filter assembly
2. Drain valve (DV-48)
3. Three-way plug valve (CV-36)
4. Precoat funnel
5. Control valve (CV-35)

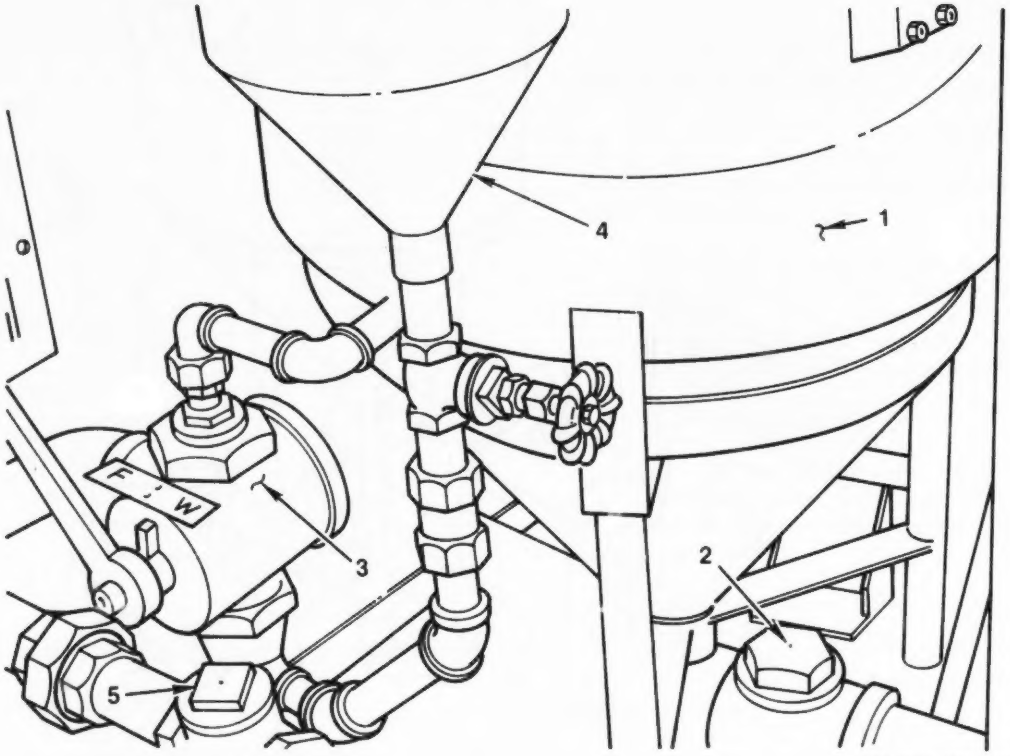

Figure 2-28. Diatomite Filter Assembly and Valve

(b) Close drain valve DV-48 (2, fig. 2-28 or fig. 2-29) after all water has been drained from diatomite filter assembly.

(c) Turn air release valve ARV-49 (1, fig. 2-30) located on top of the filter housing cover (2), to filter position.

(d) Turn three-way plug valve CV-36 (3, fig. 2-28 or 2-29) located in the coagulated water piping, to F (filter) position.

(e) Turn three-way plug valve CV-46 (1, fig. 2-31 or 2-32) located in filtered water piping, to R (recirculate) position.

(f) Open plug cocks DC-41 (7, fig. 2-30) and DC-43 (8) located in the influent pressure gage line and effluent pressure gage line.

(g) Close control valve CV-40 (11) located in filtered water piping.

(h) Open control valve CV-37 (12) located above precoating funnel (13).

(i) Open control valve CV-38 (14) located above precoating funnel (13).

(j) Prepare one base charge of diatomite slurry (para 2-4).

(k) Pour base charge of diatomite slurry into precoat funnel (13) and close control valve CV-37 (12) after diatomite slurry has drained into filter housing (17).

(l) Set flow control valve CV-45 (4) located in the filtered water line, at 20 gpm.

(m) Open control valve CV-34 (2, fig. 2-22) to admit water to filter pump assembly (1).

CAUTION

Exercise care when moving around in van body to prevent accidental closure of control valve. Accidentally stopping flow of water would in turn cause damage to filter pump assembly.

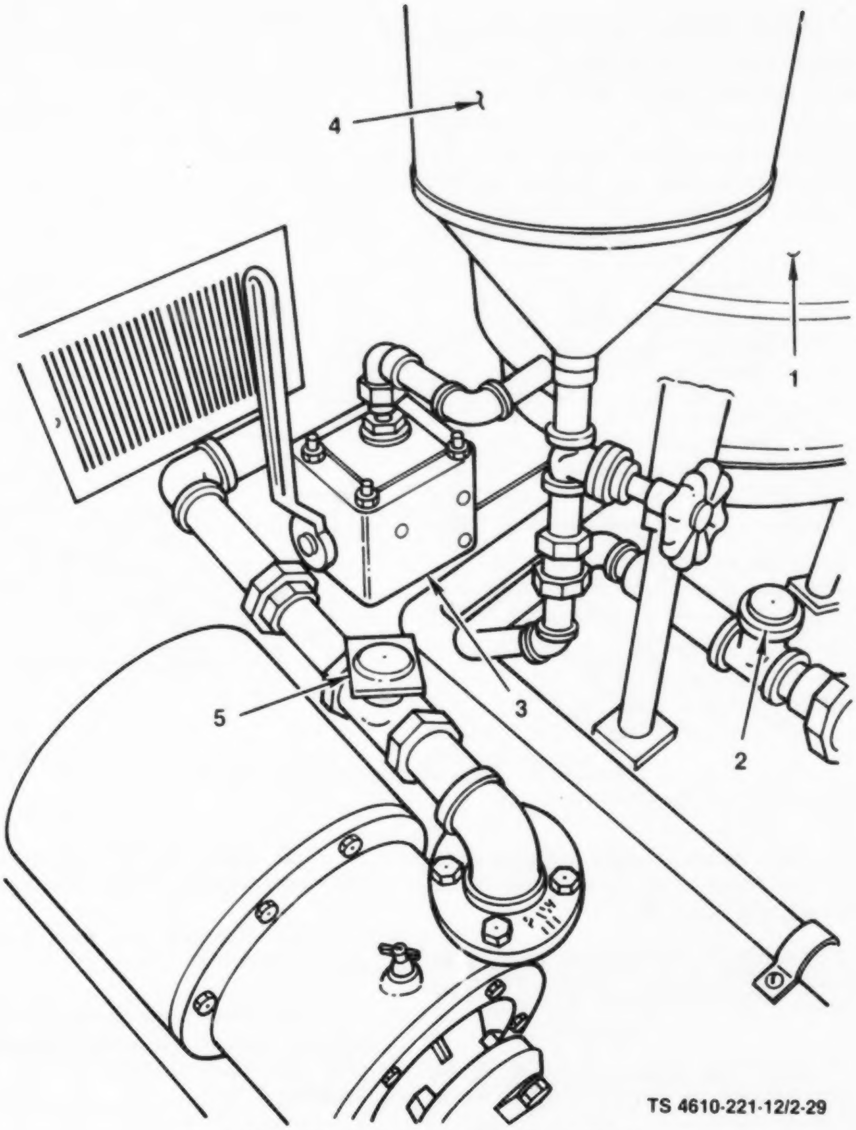
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Figure 2-29. Diatomite Filter Assembly and Values

Legend for figure 2-29:

1. Diatomite filter assembly
2. Drain valve (DV-48)
3. Three-way plug valve (CV-36)
4. Precoat funnel
5. Control valve (CV-35)

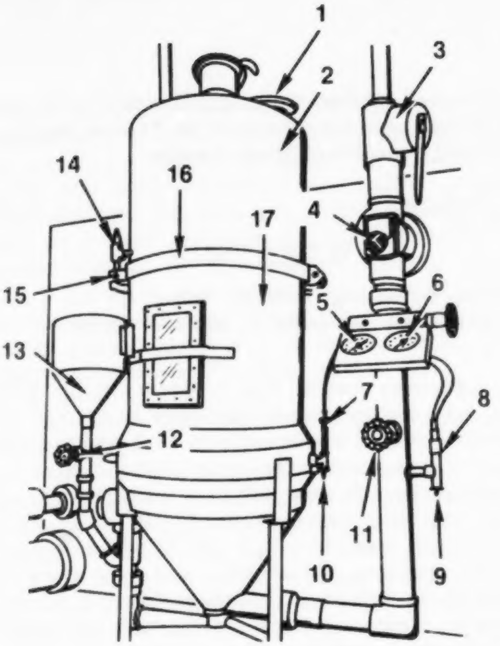

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Figure 2-30. Filter Housing Cover, Precoat Funnel, and Valves

Legend for figure 2-30:

1. Air release valve (ARV-49)
2. Filter housing cover
3. Three-way plug valve (CV-46)
4. Flow control valve (CV-45)
5. Influent pressure gage (PI-2)
6. Effluent pressure gage (PI-3)
7. Plug cock (DC-41)
8. Plug cock (DC-43)
9. Draincock (DC-44)
10. Draincock (DC-42)
11. Control valve (CV-40)
12. Control valve (CV-37)
13. Precoat funnel
14. Control valve (CV-38)
15. Screw, cap, 5/8-18 x 6 in. (2)
16. Clamp assembly (2 parts)
17. Filter housing

(n) Start filter pump assembly by pressing filter pump START button (11, fig. 2-11).

(o) Allow air to bleed from filter housing cover through control valve CV-38 (14, fig. 2-30) until water begins to flow from control valve; then close control valve CV-38.

(p) When the effluent pressure gage PI-3 (6) reads 30 psi, open control valve CV-40 (11) and allow diatomite filter to operate on recirculation until precoating on filter elements is clearly visible through the window in the diatomite filter.

(2) Starting filter run.

(a) Set flow control valve CV-45 (4) at 25 gpm.

(b) Turn three way plug valve CV-46 (3) to F (filter) position to allow water to be piped to storage containers.

(c) Open control valve CV-50 (4, fig. 2-31 or 2-32) in filtered water piping.

(d) Charge slurry feeder with diatomaceous earth as follows:

1. Set diatomite slurry feed variator FEI-5 (3, fig. 2-6) at zero.

2. Open control valve CV-32 (2) to allow filtered water to enter the left compartment of slurry feeder assembly.

3. Partially close control valve CV-50 (4, fig. 2-31 or 2-32) to allow back pressure to be created and for water to slurry feeder assembly to flow more freely.

4. Close control valve CV-32 (2, fig. 2-6) when filtered water level in slurry feeder assembly reaches high level mark on liquid indicator (12, fig. 2-26) inside slurry feeder.

5. Open control valve CV-50 (4, fig. 2-31 or 2-32) all the way.

6. Turn two latches (6, fig. 2-6) and open charging door (5). Measure 7 pounds (3.2 kg) of diatomaceous earth (item 7, App. E) and add it to the left compartment of the slurry feeder assembly.

NOTE

An aluminum measure, which is a component of the water purification set, is provided for measuring diatomaceous earth. This measure is graduated in 1/2 pound (227 g) increments.

7. After diatomite slurry has been thoroughly mixed, set diatomite slurry feed variator FEI-5 (3) at 30 ppm dosage as shown on diatomaceous earth slurry calibration chart (fig. 2-19).

2-5. Operation.

WARNING

Operation of this equipment presents a NOISE HAZARD to unprotected personnel. Wear ear muffs or earplugs which were fitted by a trained professional.

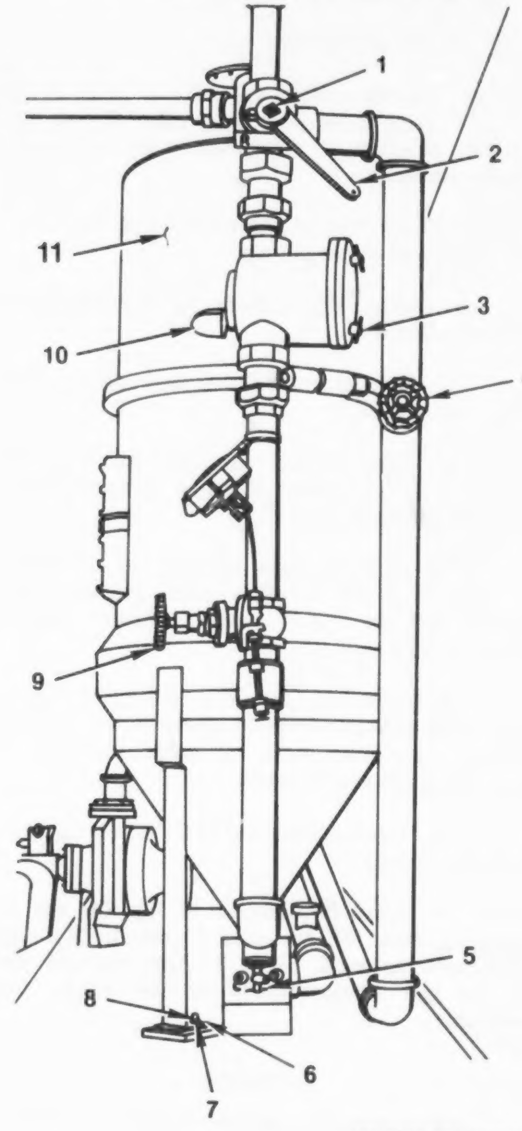

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Figure 2-31. Filter Water Control Valves (MET-PRO Models)

a. General. After water purification unit has been started, adjustments must be made to regulate quality and quantity of filtered water.

b. Erdlator.

WARNING

When adjusting control valve CV-11, remain clear of erdlator agitator drive.

(1) Aeration control. The aspirators (2, fig. 2-33) (2, fig. 2-34 for unit serial numbers 816-1083) are in manifold located above erdlator tank and provide aeration of raw water entering influent launders (1). The normal operating reading of raw water pressure gage PI-1 (3) with control valves CV-10 (8, fig. 2-24) and CV-11 (9) open, is 5 to 7 psi. If pressure rises above this reading, it indicates that aspirators (2, fig. 2-33) (2, fig. 2-34 for unit serial numbers 816-1083) are clogged. Remove foreign matter from aspirators to remedy this condition. If numerous air bubbles are observed on surface of water in erdlator tank, it indicates that water is supersaturated with dissolved gases. Partially close or completely close one or both control valves CV-10 (8, fig. 2-24) and CV-11 (9), as necessary, to remedy this condition. This corrective action increases pressure and aeration and releases dissolved gases. Adjust raw water influent flow as described in paragraph 2-4.

Legend for figure 2-31:

1. Three-way plug valve (CV-46)
2. Handle
3. Draincock (2)
4. Control valve (CV-50)
5. Draincock (DC-39)
6. Washer, lock, 1/2 in. (3)
7. Nut, plain, hex, 1/2-13 (3)
8. Screw, cap, 1/2-13 x 6 1/2 in. (3)
9. Control valve (CV-40)
10. Flow control valve (CV-45)
11. Diatomite filter assembly

(2) Slurry blanket rotation. The slurry blanket in the erdlator tank must be kept rotating. Banking of the slurry blanket on outer circumference indicates too much rotation. Insufficient rotation is indicated by a lack of slurry blanket rotation around and near outer circumference. The rotation of the slurry blanket is decreased by moving V-belt (5, fig. 2-35) to a smaller groove of pulley (6) and increased by moving V-belt to a large groove of motor pulley. Move belt to desired pulley groove, see paragraph 2-4d. (5), steps (a) thru (f).

(3) Slurry level control and sludge removal.

(a) After water purification unit has operated continuously for several hours, the amount of slurry in the erdlator tank will increase until slurry blanket reaches erdlator tank slurry drawoff port that flows into the slurry weir box, welded to erdlator tank. The slurry flows through the slurry weir box into sludge concentrator tank (6, fig. 2-27). Under normal operation, plug control valve, CV-16 (1) on the false bottom of the sludge concentrator tank will be kept open. The slurry blanket will rise in concentrator tank until it reaches top rim of circular baffle. The amount of slurry flow from erdlator to concentrator equals flow through plug control valve CV-17 (2) into wet well tank (4) and drain valve DV-21 (4, fig. 2-21) to waste.

NOTE

If flow of water drawn through control valve CV-17 (2, fig. 2-27) into wet well tank (4) or amount of sludge drained to waste through gate drain valve DV-21 (4, fig. 2-21) is too great, it will cause turbulence in concentrator tank and cause slurry carryover to wet well tank

Legend for figure 2-32:

1. Three-way plug valve (CV-46)
2. Handle
3. Draincock (2)
4. Control valve (CV-50)
5. Draincock (DC-39)
6. Washer, lock, 1/2 in. (3)
7. Nut, plain, hex, 1/2-13 (3)
8. Screw, cap, 1/2-13 x 6 1/2 in. (3)
9. Control valve (CV-40)
10. Flow control valve (CV-45)
11. Diatomite filter assembly

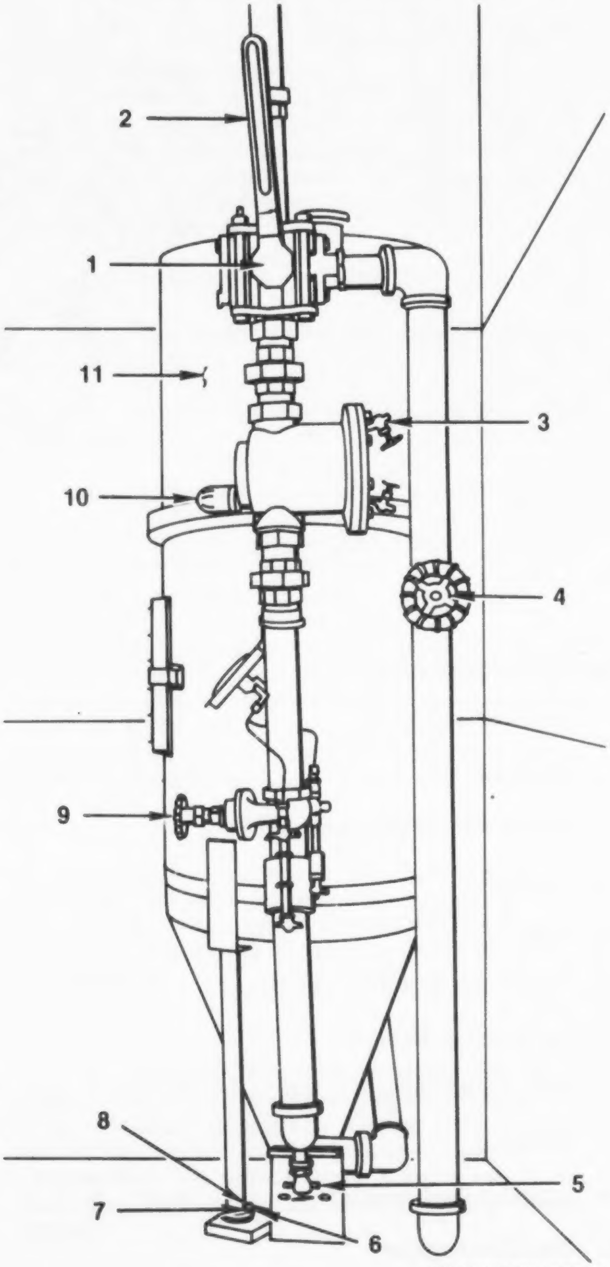

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Figure 2-32. Filter Water Control Valves (ETC Models)

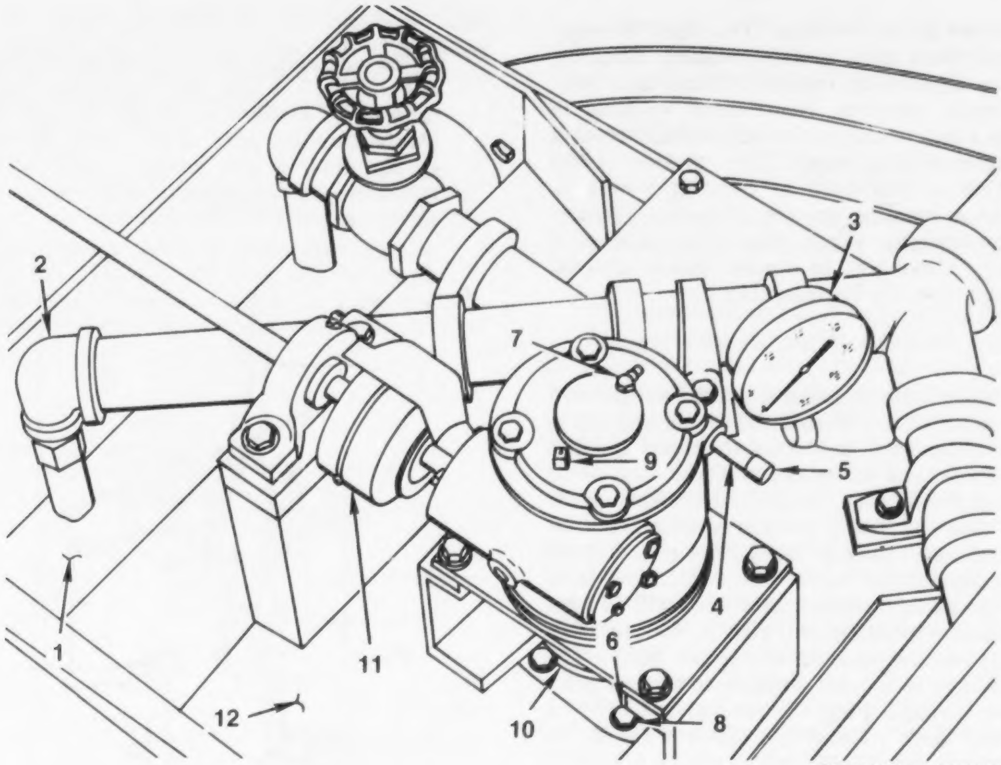

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Figure 2-33. Raw Water Pressure Gage and Aspirators (Met-PRO Models)

Legend for figure 2-33:

1. Influent launder (2)
2. Aspirator (4)
3. Raw water pressure gage (PI-1)
4. Drainplug
5. Cap
6. Screw, cap, 5/16-18 x 1 in. (4)
7. Lubrication fitting
8. Nut, washer, lock, ET, 5/16 in. (4)
9. Fill plug
10. Agitator shaft bearing
11. Flexible coupling
12. Motor mount plate

(b) Open gate drain valve DV-21 (4) at bottom of sludge concentrator tank, to a position at which sludge can be drained to waste at a rate of flow that will not permit slurry blankets in sludge concentrator tank to rise above or fall below top rim of circulator baffle.

(c) In heavy, turbid water when sludge concentrator tank has to be drained rapidly, close plug control valve CV-16 (1, fig. 2-27) to prevent compacting heavy slurries in circular portion and increase opening of gate drain valve DV-21 (4, fig. 2-21) to waste tank.

(d) The slurry blanket in erdlator tank will be maintained at a level to keep slurry drawoff in the side of the erdlator tank just visible by increasing or decreasing the rate of slurry flow from erdlator tank into sludge concentrator tank. To change rate of slurry flow from the erdlator tank to concentrator tank, adjust plug control valve CV-17 (2, fig. 2-27) to the wet well tank.

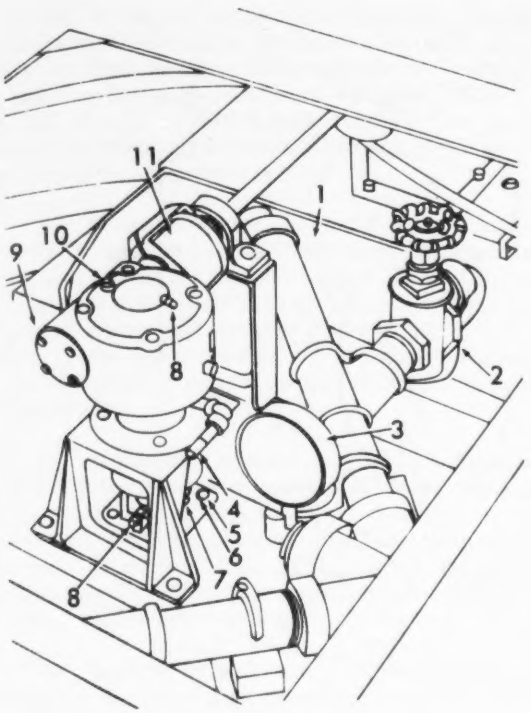

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Figure 2-34. Raw Water Pressure Gage and Aspirators (ETC Models)

Legend for figure 2-34:

1. Influent launder (2)
2. Aspirator (4)
3. Raw water pressure gage (PI-1)
4. Lubricant drain line cap
5. Screw, cap, 5/16-18 x 1 in. (4)
6. Washer, lock, 5/16 in. (4)
7. Agitator shaft bearing
8. Grease fitting (2)
9. Speed reducer mounting plate
10. Lubricant fill plug
11. Flexible coupling

NOTE

The control valve CV-14 (1, fig. 2-21) in piping from slurry weir box to sludge concentrator tank should be completely open. Never use this valve to control rate of slurry flow into sludge concentrator tank.

(4) Wet well tank. The operation of low water level indicator light and warning buzzer indicates low water in wet well tank. If low water level persists in wet well tank, decrease filter flow through flow control valve CV-45 (4, fig. 2-30) to 22 gpm; then if low water level still continues, turn three-way plug valve CV-46 (3) to R (recirculate) to maintain coating on filter elements until the trouble can be determined. Low water could be caused by any of the following defects:

(a) Suction strainer (28, fig. 2-25) clogged.

(b) Raw water suction hoses (30 or 22) damaged or clogged.

(c) Raw water pump (3) fails to deliver sufficient water.

(d) Aspirators (2, fig. 2-33 or 2-34) clogged.

(e) Valves not properly positioned.

c. *Chemical Feed Equipment.*

(1) Adjustment of chemical dosage settings. It is necessary for the operator to apply proper chemical treatment as noted by his own observations based on clarity of the water above slurry pool in erdlator tank, and by filterability of this water or by length of filter run.

NOTE

For specific guidance in determination of proper chemical feed rates during start up and operation, refer to TM 5-6630-215-12, Water Quality Analysis Set, Preventive Medicine.

(a) If treated water above slurry blanket in erdlator tank looks cloudy, increase ferric chloride solution rate of discharge by moving ferric chloride feed variator FEI-7 (1, fig. 2-8) to a higher feeder scale reading. Use ferric chloride solution calibration chart (fig. 2-16) as an aid in determining proper setting.

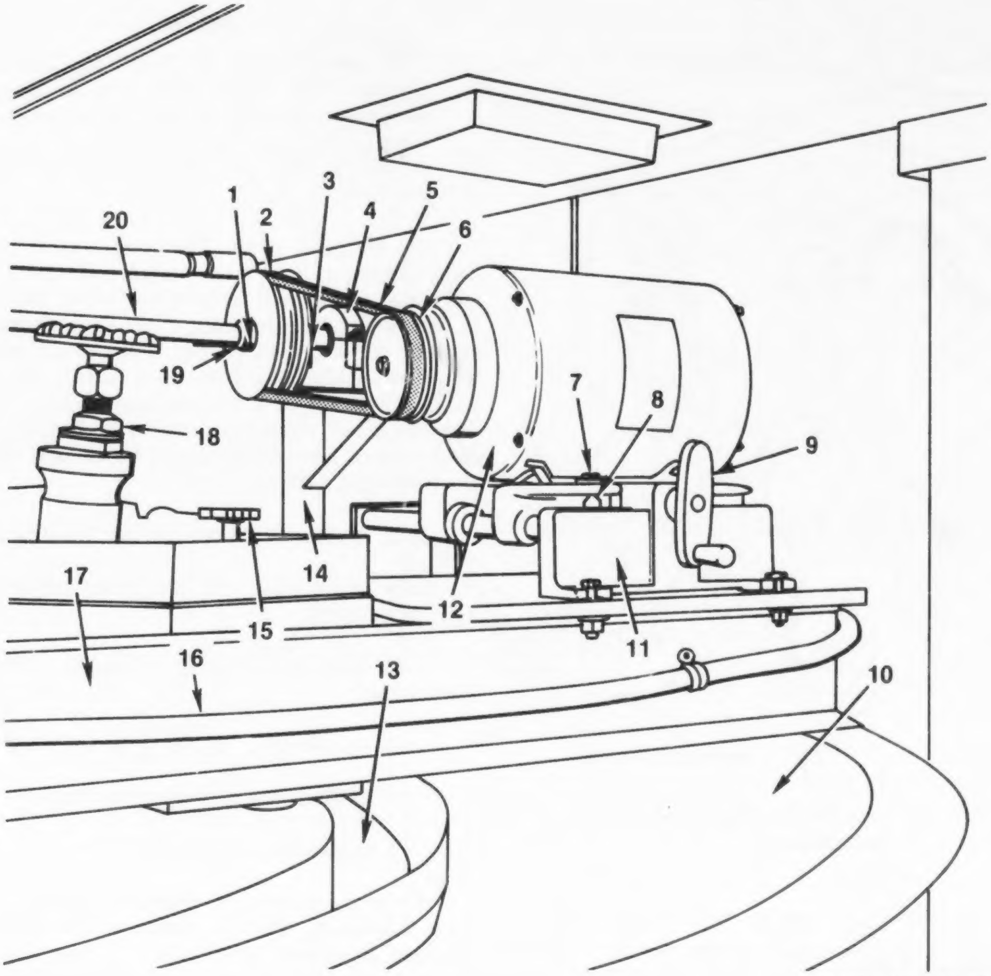

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Figure 2-35. Erdlator Agitator and Effluent Launder, Adjusting

Legend for figure 2-35:

1. Setscrew, 1/4-20 x 3/8 in. (2)
2. Pulley, 4 in.
3. Setscrew, 5/16-18 x 1 1/2 in. (4)
4. Bearing unit (2)
5. V-belt
6. Pulley
7. Screw, cap, 3/8 x 1 1/2 in. (4)
8. Washer, flat, 3/8 in. (8)
9. Handwheel
10. Erdlator tank
11. Agitator motor base
12. Motor assembly
13. Effluent launder
14. Bracket (2)
15. Effluent launder leveling rod (3)
16. Electrical cable
17. Bridge rail
18. Control valve (CV-11)
19. Collar (2)
20. Erdlator drive shaft

(b) If treated water above the slurry blanket in erdlator tank begins to have a reddish color, decrease ferric chloride solution rate of discharge by moving ferric chloride feed variator FEI-7 (1, fig. 2-8) to a lower feeder scale reading. Use ferric chloride solution calibration chart (fig. 2-16) as an aid in determining proper setting.

(c) If treated water above the slurry blanket in erdlator tank looks clear, but large particles are rising and the slurry blanket looks light and fluffy, increase limestone slurry rate of discharge by moving limestone slurry feed variator FEI-6 (1, fig. 2-7) to a higher feeder scale reading. Use limestone slurry calibration chart fig. 2-18 as an aid in determining proper setting.

(d) If a sample of slurry withdrawn from the bottom of the sludge concentrator tank contains visible quantities of limestone, decrease limestone slurry rate of discharge by moving limestone slurry feed variator FEI-6 (1, fig. 2-7) to a lower feed scale reading. Use limestone slurry calibration chart (fig. 2-18) as an aid in determining proper setting.

(e) In order to maintain a chlorine residue in filtered water, determine the chlorine residue every 30 minutes, use color comparator (paragraph 2-5 d.) and adjust calcium hypochlorite solution rate of discharge until proper residue is obtained. If chlorine residue is less than that prescribed by the medical officer, increase calcium hypochlorite solution rate of discharge by moving calcium hypochlorite feed variator FEI-8 (3, fig. 2-8) to a higher scale reading. If chlorine residue is greater than the required amount, decrease calcium hypochlorite solution solution rate of discharge by moving calcium hypochlorite feed variator FEI-8 (3) to a lower scale reading. Use calcium hypochlorite solution calibration chart (fig. 2-17) as an aid in determining proper setting.

(f) To increase length of the filter runs, increase diatomaceous earth slurry rate of discharge by moving diatomite slurry feed variator FEI-5 (3, fig. 2-6) to a higher feeder scale reading. Use diatomaceous earth slurry calibration chart (fig. 2-19) as an aid in determining proper setting.

(g) To decrease length of the filter runs, decrease diatomaceous earth slurry rate of discharge by moving diatomite slurry feed variator FEI-5 (3, fig. 2-6) to a lower feeder scale reading. Use diatomaceous earth slurry calibration chart (fig. 2-19) as an aid in determining proper setting.

(h) If the water has an objectionable color, taste, or odor, add activated carbon to limestone compartment of slurry feeder as described in paragraph 2-4 b. (8).

(2) Recharging slurry feeder. When level of limestone or diatomaceous earth slurry in feeder reaches low liquid level tab on level gage (mounted on inside wall of slurry feeder), recharge compartment requiring additional slurry solution. Recharge limestone compartment as described in paragraph 2-4d. (4), except that required amount of limestone for recharging is 11 pounds (5.0 kg). Recharge diatomaceous earth compartment as described in paragraph 2-4 e., except that required amount of diatomaceous earth for recharging is 5 1/2 pounds (2.5 kg).

(3) Recharging solution feeder tanks. When the level of ferric chloride or calcium hypochlorite solution in the solution feeder tanks drops to approximately 4 1/2 inches (11 cm) from the bottom, recharge tank requiring additional chemical solution as described in paragraph 2-4 b.

d. Operating Instructions To Determine Free Chlorine Residue. The comparator, color, hydrogen ion, residual chlorine disk type, prism viewing (NSN 6630-01-044-0334) issued for use with the unit is designed to give convenient and accurate measurements. The chlorine residue is determined colorimetrically. When a chemical reagent known as orthotolidine indicator solution is added to a water sample containing chlorine, a characteristic color is produced which indicates the amount of chlorine present. The value of the sample may be determined by comparing its color with those of a calibrated set of color standards. Permanent glass color standards are employed in the comparator and it is constructed so that the water sample is easily compared with the standards. A prismatic eyepiece bring the sample and standard side-by-side for accurate comparison. The measurement of chlorine in water is extremely important since bacterial purity of water is governed by amount of chlorine present. Standard practice calls for addition of sufficient chlorine (calcium hypochlorite slurry) to produce a slight excess of chlorine after chlorine and water have been in contact for 30 minutes. This excess of residual chlorine is measured by the comparator and is used as a guide to proper chlorination. Normally a residue of 1 ppm (part per million) after chlorine water have been in contact for 30 minutes indicates that water is bacterially safe for human consumption.

(1) Select two clean comparator cells.

(2) Fill one cell to mark with water under test.

(3) Insert this cell in right hand cell space of comparator.

NOTE

This cell, when filled to mark with water under test, compensates for color and turbidity. The omission of this step may cause serious errors.

(4) Collect just enough water to cover the bottom of the second cell (2-3 ml).

(5) Add one DPD tablet (No. 1) and crush with rod.

(6) Fill this cell to mark with water under test and insert it in the left-hand cell space of the comparator. Compare with color standards of the appropriate disk as rapidly as possible. Record result which is the closest match as the value of free residual chlorine level of test sample. Interpolation between two values may be necessary (only free chlorine residue test is described since total chlorine residue test has been deleted and the pH test remains the same as with the old kit).

e. Component List.

(1) 1-Color comparator with prismatic eyepiece assembly.

(2) 4-Rectangular sample cells.

(3) 1-pH reagent bottle, with eye dropper.

(4) 1-DPD chlorine color, disk.

(5) 1-pH color disk.

(6) Operating instructions.

(7) Service data.

(8) Carrying case.

(9) Reagent: Tablet, reagent DPD (NSN 6810-01-044-0315)

f. Filter Operation Check. Should any of the following occur, backwash filter elements and wash filter bottom (para 2-5 f.):

(1) Large areas of filter elements are not covered with diatomaceous earth.

(2) The suspended material is visible in filtered water or water appears cloudy.

(3) If the effluent pressure gage PI-3 (6, fig. 2-30) reads less than 4 psi.

(4) If filtered water flow drops noticeably indicating that it is no longer practical to continue filter run. To put filter in operation again, refer to paragraph 2-4 e.

g. Maintaining Coating on Filter Elements During Nonproductive Period. When there is no demand for filtered water, but it is desired to maintain coating on filter element, recirculate filtered water back to wet well tank.

(1) Turn three-way plug valve CV-46 (3, fig. 2-30 to R (recirculate).

(2) Reduce flow control valve CV-45 (4) setting to 10 gpm. This rate of flow will hold coating on filter elements.

WARNING

Air that is released from pressure valve can cause serious injury to personnel if standing too close.

h. Backwash and Filter Bottom Wash Process. When a filter run is stopped for any reason, backwash filter elements and wash filter bottom. Turning air release valve ARV-49 to BACKWASH position allows air compressed in dome of filter to be released to the atmosphere. This sudden release of air allows the air compressed in cups of each filter element to expand rapidly, forcing a small quantity of filtered water back through element and filter cake. This rapid reversal of flow usually dislodges all suspended matter from elements. If it does not, elements must be removed and manually cleaned. Most of the dislodged suspended matter will be removed when water in the influent section drains to waste through drain valve DV-48 (2, fig. 2-28). However, some of the suspended matter may settle on the conical bottom of the influent section and must be washed away.

(1) Close control valve CV-40 (11, fig. 2-30) in the filtered water piping.

(2) Allow filter pump assembly to continue operating until effluent pressure gage PI-3 (6) pressure approximates the influent pressure gage PI-2 (5) pressure, then press filter pump STOP button (8, fig. 2-11).

(3) Close control valve CV-34 (2, fig. 2-22) in coagulated water piping to filter pump assembly (1).

(4) Turn air release valve ARV-49 (1, fig. 2-30) to backwash positon, then immediately open drain valve DV-48 (2, fig. 2-28) in waste water piping from diatomite filter assembly (1).

(5) After diatomite filter assembly has completely drained, turn three-way plug valve CV-36 (3) to W (wash) position. This will allow water to flush bottom of the filter.

(6) Open control valve CV-34 (2, fig. 2-22).

(7) Press filter pump START button (11, fig. 2-11) and allow filter pump assembly to run for a period of not more than one minute.

(8) Press filter pump STOP button (8).

(9) Close control valve CV-34 (2, fig. 2-22).

2-6. Stopping.

a. Stopping Filter Section.

CAUTION

This unit retains water in its piping assemblies and is susceptible to damage from freezing, if not properly drained. In order to completely drain the system and avoid the referenced damage, follow step-by-step draining instructions.

NOTE

Instructions that follow suffice for both model units.

(1) Backwash filter elements and flush out filter bottom (para 2-5 h.).

(2) Open draincock DC-39 (5, fig. 2-32) and drain filtered water piping.

(3) Open control valve CV-40 (9) in filtered water piping and set flow control valve CV-45 (10) at 30 gpm.

(4) Remove vent plug and open draincocks (3), draining water from within flow control valve CV-45.

(5) Turn three-way plug valve CV-46 (1) to R (recirculate) position.

(6) Open draincocks DC-42 (10, fig. 2-30) and DC-44 (9) in the influent and effluent filter pressure gage lines.

(7) Turn three-way plug valve CV-46 (1, fig. 2-31 or 2-32) to F (filter) position.

(8) Open control valve CV-38 (14, fig. 2-30) above precoat funnel (13) and control valve CV-37 (12) below precoat funnel.

(9) Open draincock DC-47 (5, fig. 2-22) and drain water from filter pump assembly (1).

b. Stopping Water Treatment Section. The water treatment section can be partially drained for short periods of time (not exceeding 24 hours) to allow water purification unit to be placed in operation much faster than if it were completely drained. Be sure drain valve DV-23 (6, fig. 2-21) is open.

(1) Adjust limestone slurry feed variator FEI-6 (1, fig. 2-7) and diatomite slurry feed variator FEI-5 (3, fig. 2-6) to zero reading.

(2) Press slurry feeder STOP button (9, fig. 2-11).

(3) Remove plastic tubes (7 and 8, fig. 2-20) from solution tanks (5 and 6). Allow chemical solution feeder to operate until all solution is pumped from plastic tubes and press solution feeder STOP button (4, fig. 2-11).

(4) Press raw water STOP button (5). If two electrical driven raw water pumps are used for suction, press distribution pump STOP button (6).

(5) Press erdlator agitator STOP button (7).

(6). Open drain valve DV-25 (3, fig. 2-21) in waste water piping from wet well tank (2).

(7) Open control valves CV-16 (1, fig. 2-27) and CV-17 (2) if they have been closed or partially closed during opeation.

(8) Open drain valve DV-21 (4, fig. 2-21) in waste water piping from sludge concentrator tank (5) and drain sludge concentrator tank (5) for short period shutdowns.

(9) If water purification unit is to be stopped for periods exceeding 24 hours, open drain valve DV-22 (4, fig. 2-22) and completely drain sludge concentrator tank.

(10) Open drain valve DV-19 (9, fig. 2-21) in waste water piping from erdlator tank (10) and partially drain erdlator tank.

(11) If water purification unit is to be stopped for a period of time exceeding 24 hours, open drain valve DV-20 (8) and completely drain erdlator tank.

(12) Open drain valves DV-26 (1, fig. 2-23) and DV-27 (2) below slurry feeder assembly (3).

(13) Open control valve CV-34 (2, fig., 2-22) in coagulated water piping and allow water to drain through draincock DC-47 (5).

(14) Fully open control valve CV-7 (1, fig. 2-4) and vent cock VC-6 (2) to permit draining from raw water piping.

(15) Open control valve CV-8 (2, fig. 2-7) in raw water piping to slurry feeder assembly (7).

(16) Open control valves CV-32 (2, fig. 2-6) and CV-33 (1) in filtered water piping to the slurry feeder assembly.

(17) Open control valves CV-9 (5, fig. 2-24), CV-10 (8), CV-11 (9), and bypass valve BPV-12 (7) in raw water piping above erdlator tank (10).

Section II. OPERATION OF AUXILIARY EQUIPMENT

2-7. Personnel Heater Starting and Stopping.

a. *Starting.*

(1) Turn thermostat control knobs (3, fig. 2-36), located in left rear corner of van body ceiling, to desired temperature.

(2) Open fuel shutoff valve (5, fig. 2-37).

(3) Place heater control switch (6) in HEATER position.

(4) After switch has been placed in HEATER positon, observe action of the two indicator lignts.

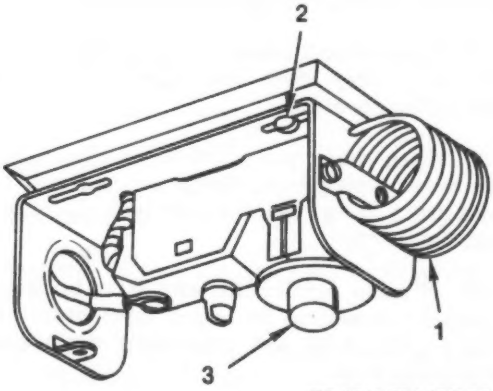

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Figure 2-36. Thermostat, Cover Removed, Installed View

Legend for figure 2-36:

1. Thermostat
2. Holding screw, cover removed
3. Control

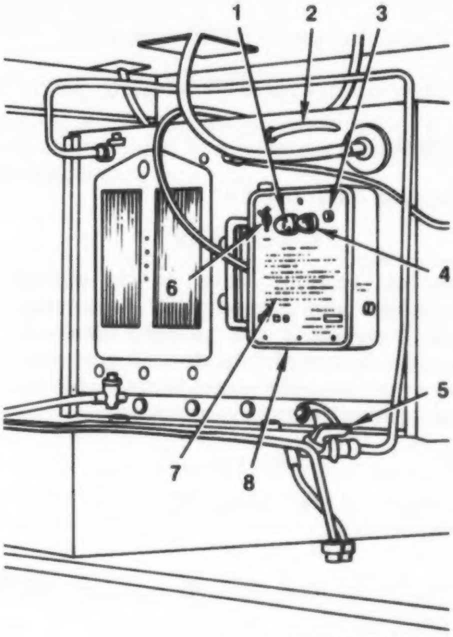

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Figure 2-37. Heater Controls

Legend for figure 2-37:

1. Heater indicator light
2. Louver control handle
3. Heater reset button
4. Heater warning light
5. Fuel shutoff valve
6. Heater control switch
7. Instruction plate
8. Control box

(a) The white heater indicator light (1) should come on immediately, indicating that heater is operating.

(b) The red heater warning light (4) should come on and remain on until a sufficient amount of fuel is pumped into burner head.

(5) If neither light comes on and combustion motor does not run, make sure electrical connectors are connected correctly and that circuit breaker (1, fig. 2-14) located inside electrical control cabinet is in the ON position and that thermostat is set in operating position.

(6) If the heater fails to run, the red light will stay on. Wait 30 seconds then press heater reset button (3, fig. 2-37) which should again start the heater. If heater fails to run and the red light stays on or if heater shuts off after it has run for only a minute or two, inspect for fuel or ignition failure. Correct trouble or report it to field maintenance.

(7) Return air may be recirculated or so adjusted be louver operating handle (2) that all or any part may be taken in from outside.

(8) In warm weather or when it is desired to use the unit for unheated ventilating air only, place heater control switch (6) in FAN position.

b. Stopping.

(1) Place heater control switch (6) in OFF position.

NOTE

> *The heater will continue to operate at intervals automatically for a short time after it is shut off. This permits even cooling of heater components.*

(2) Close fuel shutoff valve (5).

(3) If the heater is to be shut down for long periods of time, disconnect electrical connector from main power receptacle.

c. Operation in Extreme Cold. Service fuel filter and fuel pump more frequently to remove accumulated water or ice if fuel is stored in a cold site.

d. Operation in Extreme Heat. Electrical cable sheathing and rubber parts deteriorate more quickly in extreme heat; check for signs of failure more frequently.

e. Operation in Dusty or Sandy Areas.

(1) Take all necessary precautions to keep dust and sand from entering the fuel supply and lines. Service fuel filter and fuel pump more frequently to remove accumulated sediment.

(2) Provide maximum protection for equipment at all times. Take advantage of natural barriers whenever possible.

f. Operation Under Rainy or Humid Conditions.

(1) Close doors whenever possible to keep moisture out. During dry periods when equipment is not in use, open all doors and panels to allow unit to dry.

(2) Take all necessary precautions to keep moisture from entering fuel supply. Service fuel filter and fuel pump more frequently to remove any accumulated moisture.

(3) Dampness increases corrosive action. Inspect painted surfaces and electrical connections more frequently for damage. Using petroleum jelly, coat all unprotected surfaces that do not come in contact with burner, combustion chamber, or heat exchanger.

g. Operation in Salt Water Areas.

(1) Wash salt deposits from equipment with fresh water whenever possible.

(2) Observe all precautions listed under f. above.

h. Operation in High Altitudes. No effective change in operation is required for operation at high altitudes. The fuel supply may need to be regulated to adjust to less dense air.

i. For additional information and maintenance and repair procedures, refer to TM 5-4520-227-14.

2-8. Fire Extinguisher.

a. Carbon Dioxide Type.

(1) Descripion. The carbon dioxide type fire extinguisher is suitable for electrical and flammable liquid fires. The carbon dioxide types are in 4 pound (1.8 kg), 7 1/2 pound (3/4 kg) and 10 pound (4.5 kg) sizes. The 4 pound (1.8 kg) extinguisher is portable; the other two are fixed.

(2) Operation. Remove fire extinguisher from its location; break seal, operate control valve, and direct stream at base of flame.

(3) Maintenance. For maintenance of fire extinguisher, refer to TM 5-687.

b. Monobromotrifluoromethane Type.

(1) Description. The monobromotrifluoromethane type fire extinguisher is generally suitable for all types of fire, except fires involved with LOX (liquid oxygen) generating equipment. The fire extinguisher is furnished with a disposable-type cylinder.

(2) Operation. To operate fire extinguisher, perform the following:

(a) Remove fire extinguisher from its location.

(b) Break seal by pulling safety pin from handle.

(c) Point horn at base of flame.

(d) Press trigger for discharge and direct stream at base of flame.

(e) Replace extinguisher immediately after using.

(3) Maintenance. Weigh fire extinguisher every 3 months and replace extinguisher if gross weight has decreased 4 ounces (112 g) or more. Lubricate cylinder neck threads with one drop of OE30 oil before reassembly.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-9. General.

The 1500 gph water purification unit is capable of performing satisfactorily in varied temperatures and weather conditions. Operations other than under normal conditions will require special operation and maintenance precautions when locating, installing, and operating equipment. For information and instructions pertaining to treatment of unusual or poisoned water, refer to TM 5-700. The water purification unit will not remove salt from water. For operation of the truck chassis under unusual conditions, refer to applicable technical manual.

2-10. Operation in Extreme Cold.

a. General. The water purification unit must be inspected more frequently during cold weather operation. Extremely low temperatures reduce the shock resistant properties of metals and decrease their resistance to strain.

b. Location. Locate equipment where advantage may be taken of existing shelter and windbreaks. Park truck on planking or other solid footing to prevent tires from freezing to the gound.

WARNING

Do not touch metal parts with bare hands when temperature is extremely low.

c. Heating. Use personnel heater provided to heat water purification unit. Keep truck chassis fuel tank as full as possible at all times to prevent condensation.

d. Lubrication. Lubricate water purification unit as prescribed in current lubrication order and truck chassis as specified in applicable technical manual.

e. Purification Process. Chemical reactions are slower in cold water; suspended matter settles slowly and water is more difficult to filter. These factors complicate water treatment process and if clarity of water cannot be obtained, reduce input rate to erdlator tank and filter rate from 25 gpm to 20 gpm. In cold water, 40 degrees F (4.4 degrees C) or less, the erdlator agitator should be set at its lowest mixing speed. When equipment is to be stopped or shut down, drain all pumps, hoses, pipes, and tanks quickly; leave all drain valves open, inspect all equipment, and be sure that it has drained completely. Instead of stopping unit to prevent freezing when there is not a continuous water demand, maintain flow of water through equipment. Put the filter on recirculation cycle and permit the erdlator to operate normally with effluent waste through the wet well overflow.

f. Adjustment of Erdlator Agitator Speed. Refer to para 2-4 d. for method of adjusting erdlator agitator speed.

2-11. Operation in Extreme Heat.

a. General. It is imperative that water being produced by water purification unit be kept as cool as possible. The covers furnished with fabric storage tanks should be used as an aid in lowering water temperature.

b. Lubrication. Lubricate water purification unit in accordance with current lubrication order and truck chassis as prescribed in applicable technical manual. It is necessary to lubricate water purification unit more frequently during operation in extreme heat.

c. Ventilation.

(1) The personnel heater can be used to ventilate the van body. Close all doors when personnel heater is operated to vent van body.

(2) Open ventilating window in rear door.

d. Purification Process. Organic matter and plant life grow faster in warm water and sunlight. The increase in plant life growth will increase the dissolved gases in shallow raw water supplies; therefore, every effort should be made to obtain raw water well beneath the surface. Keep erdlator aspirators in continuous operation to facilitate release of dissolved gases. The erdlator agitator should be operated at or near maximum mixing speed. When unit is stopped, slurry should not be stored in erdlator for periods longer than 24 hours. The increased water temperature stimulates organic fermentation and will make the stored slurry septic, causing floating floc particles.

e. Motor Starters. The efficiency of the motor starters (10, fig. 2-14) are somewhat reduced during operation in extreme heat. If the erdlator agitator motor, slurry feeder motor, filter pump motor, raw water pump motor, or distribution pump motor abruptly stops during operation, it is good chance that overload relays (9) of motor starters are prematurely cutting out. Push in reset lever (8) of overload relay to reset motor starter.

CAUTION

Under no circumstances will water purification unit be operated with door to the control cabinet open.

2-12. Operation Under Dusty or Sandy Conditions.

It is necessary to lubricate water purification unit more frequently under dusty or sandy conditions and van body doors must be kept closed as much as possible to prevent foreign material from being collected in water purification equipment. If possible, wet down surrounding area to keep down accumulation of dust. Fabric tank covers will be utilized to reduce accumulation of foreign material in filtered water.

2-13. Operation at High Altitudes.

Operation of water purification unit at high altitudes will not reflect upon its operation other than the suction lift of the raw water pump will decrease according to altitude.

CHAPTER 3

OPERATOR/CREW/MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General Lubrication Information.

Refer to LO 5-4610-221-12.

3-2. Detailed Lubrication Information.

a. *General.* Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Allow no dust, dirt, or other foreign material to mix with lubricants. Keep all lubrication equipment clean and ready to use.

b. *Cleaning.* Keep all external parts not requiring lubrication clean of lubricants. Before lubricating equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

c. Points of Lubrication. Lubricate water purification unit in accordance with current lubrication order.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-3. General.

To ensure that water purification unit is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure.

3-4. Preventive Maintenance Checks and Services.

The necessary preventive maintenance checks and services to be performed are listed and described in table 3-1. The item numbers indicate sequence of minimum inspection requirements. Defects discovered during operation of unit will be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage equipment if operation were continued. All deficiencies and shortcomings will be recorded together with corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at earliest possible opportunity.

a. Before You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. *If Your Equipment Fails To Operate.* Troubleshoot with proper equipment.

NOTE

If equipment must be kept in continuous operations, check and service only those items that can be checked and serviced without disturbing operation. Make complete checks and services when equipment can be shut down.

All data on pages 3-2 and 3-3, including figure 3-1, deleted.

Table 3-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE OPERATION
D-DURING OPERATION
A-AFTER OPERATION

ITEM NO.	INTERVAL B	D	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
1				Carrier Vehicle	PMCS will be performed by vehicle operator as directed by applicable vehicle TM.	
2	●			Water Purification Unit	a. Check for proper ground connection (para 4-5n).	Unit not grounded properly.
	●				b. Check unit for obvious damage and missing or loose components and hardware.	Deficiencies are discovered which could result in a mission failure.
	●				c. Check sludge concentrator tank, wet well tank, erdlator tank, and waste water tank for accumulation of dirt or foreign material. Clean tanks if dirty.	
		●			d. Inspect diatomite filter through window for dirt or accumulations of foreign materal. Clean filters if dirty.	
3	●			Fire Extinguisher	Check for a missing extinguisher, a broken seal, or low charge. Replace extinguisher if charge is low, seal is broken, or extinguisher is missing.	
4				Controls and Instruments	While the unit is operating, check controls and instruments for proper operation. Normal operating readings:	Controls and instruments indicate that unit is operating improperly.
		●		a. Raw water pressure gage	10-15 psig.	
		●		b. Influent pressure gage	0-65 psig.	

Table 3-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES--continued

	INTERVAL			B-BEFORE OPERATION D-DURING OPERATION	A-AFTER OPERATION	
ITEM NO.	B	D	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
		●		c. Effluent water pressure gage	0-65 psig.	
		●		d. Aspirator manifold discharge pressure gage	10-15 psig.	
		●		e. Rate of flow indicator	20-30 gpm.	
		●		f. Low water level warning light and buzzer	Check light and buzzer by depressing float assembly (fig. 4-47) until alarm switch activates. Indicator light shall light and buzzer shall sound. NOTE Be sure buzzer shut-off switch is in "ON" position when testing.	
5		●		Piping, Tubing, and Connections	While unit is operating, check the system piping, tubing, and connections for leaks.	
6		●		Gear Drive assemblies	Check for oil leaks around covers and shaft seals.	Leaks cannot be corrected by operator/ crew.
7			●	Drain Valves and Cocks	To prevent damage to the unit during freezing weather, open all drain valves and drain cocks, including raw water pump drains, and drain the water from the unit. (Refer to fig. 2-1 and table 2-1 for location of drain valves and drain cocks.)	

All data on pages 3-6 through 3-11 deleted.

All data on pages 3-6 through 3-10 deleted.

All data on page 3-11 deleted.

Section III. TROUBLESHOOTING

3-5. General.

a. This section contains troubleshooting information for locating and correcting most operating troubles which may develop in water purification unit. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. The table lists common malfunctions which you may find during operation or maintenance of water purifiction unit or its components. You should perform tests/inspections and corrective actions in order listed.

3-6. Operator Troubleshooting.

For operator's troubleshooting, refer to table 3-2.

NOTE

Before you use this table, be sure you have performed all normal operational checks. If you have a malfunction which is not listed in this table, notify the next higher level of maintenance.

Section IV. MAINTENANCE PROCEDURES

NOTE

In the following maintenance sections, all components, piping, etc. which come in contact with raw, coagulated or filtered water and are cleaned with drycleaning solvent should be thoroughly rinsed with water to remove any solvent residue. Solvent residue left on components could cause a bad taste or odor.

3-7. Clearance Marker Light.

a. General. The clearance marker lights are mounted in pairs at upper corners of the van body. A group of three service lights are mounted on the front of the van at top center and on the rear at the top center. The top clearance marker lights on the rear of the van body have red lenses and the top lights on the front of the van body have amber lenses. The lower lights on the rear of the van body have red blackout lenses and the lower lights on the front of the van body have white blackout lenses. The service lights on the front are amber; lights on the rear are red. All clearance lights are 24 volts and are controlled from truck cab.

b. Cleaning.

(1) Remove two screws (1, fig. 3-2) and lift door (11) with lens (2) off lampholder base (10).

(2) Clean lamp, lens, and door.

(3) Install door (11) with lens (2) on lampholder base (10) and secure with two screws (1).

3-8. Van Ceiling Lighting Fixture.

a. General. The three flush-mounted, 110 volt van ceiling lighting fixtures have frosted glass panels. The door of each lighting fixture is of pull-down type and is tension spring retained.

b. Cleaning.

(1) Pull door frame (9, fig. 3-3) away from ceiling 10.

(2) Compress two springs (8) together and remove door frame (9) from housing (1).

(3) Clean lamp, reflector, housing and glass.

(4) Position door frame (9) on ceiling (10), compress springs (8), and engage springs in frame.

(5) Push door frame up flush against ceiling.

3-9. Leveling Jacks and Stowage Rack Assemblies.

a. Cleaning.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

Table 3-2. Operator Troubleshooting

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. WATER PURIFICATION UNIT RECEIVES INSUFFICIENT OR NO RAW WATER

Step 1. Check if suction hose is sucking water.

Submerge the strainer deeper in water.

Tighten hose connections.

Step 2. Check if suction lift of raw water pump exceeds 20 feet (6 meters).

Move raw water pump closer to water souce or add an additional pump.

Step 3. Check to see if raw water pump is sufficiently primed.

Prime the raw water pump.

Step 4. Check for clogged suction strainer.

Clean the suction strainer. Do not allow the strainer to draw water from bottom of river or lake.

Step 5. Check if suction hoses are collapsed, clogged or damaged.

Remove obstructions and straighten clogged or kinked hoses.

Step 6. Check if raw water pump is receiving power.

Assure proper electrical connections.

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

2. RATE OF FLOW INDICATOR SHOWS INCORRECT READING

Check if control valves are properly adjusted.

Adjust the control valves CV-9 and BPV-12 or CV-4, CV-5, and BPV-3.

3. RAW WATER PRESSURE GAGE SHOWS INCORRECT READING

Check if control valves are improperly adjusted.

Adjust the control valves CV-10 and CV-11. The normal operating reading of the raw water pressure gage PI-1 with both control valves open is 5 to 7 psi (0.35 to 0.49 kg/sq cm). If the pressure rises above this reading, it indicates that the aspirators are clogged. Remove the foreign matter from the aspirators to remedy this condition. If numerous air bubbles are observed on the surface of the water in the erdlator tank, it indicates that the water is supersaturated with dissolved gages. Partially close or completely close one or both of the control valves CV-10 and CV-11, as necessary, to remedy this condition. This corrective action increases the pressure and aeration and releases dissolved gases.

4. CHEMICAL SOLUTION FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SOLUTION.

Step 1. Check if ferric chloride or calcium hypochlorite feed variators are properly adjusted.

Adjust feed variators FEI-7 and FEI-8 (para 2-5c(1)).

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

4. CHEMICAL SOLUTION FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SOLUTION - Cont

Step 2. Check if solution supply is exhausted.

Recharge the chemical solution tanks (para 2-5c(2) and (3)).

Step 3. Check if hoses are completely submerged or loosely connected.

Submerge the hoses in the chemical solution tank and tighten hose connections.

Step 4. Check for clogged or damaged hoses.

Clean or replace clogged hoses.

Step 5. Check if feeder assembly is primed.

Prime by hand (para 2-4d(3)).

Step 6. Check if feed adjustment wingnut is loose.

Tighten the feed adjustment wingnut.

Step 7. Check to see if chemical solution feeder assembly is receiving power.

Inspect electrical connections.

5. SLURRY FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SLURRY

Step 1. Check if limestone or diatomaceous feed variators are properly adjusted.

Adjust the feed variators FEI-5 and FEI-6 (para 2-5c (1)).

Step 2. Check if slurry supply is exhausted.

Recharge the limestone slurry tank and diatomite slurry tank (para 2-5c (1)).

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

5. SLURRY FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SLURRY - Cont

Step 3. Check if limestone slurry is being flushed.

Adjust control valve CV-8 (para 2-4d(4)).

Step 4. Check if drive chain is properly adjusted.

Adjust drive chain (para 3-49).

Step 5. Check if slip clutch assembly is out of adjustment.

Adjust slip clutch (para 3-50).

Step 6. Check if slurry feeder V-belt is out of adjustment.

Adjust V-belt.

Step 7. Check for clogged orifice plugs.

Use 10 gauge wire to clean the plugs without removal.

6. LOW WATER LEVEL INDICATOR LIGHT OR WARNING BUZZER INOPERATIVE

Step 1. Check if float valve is closing completely at low water.

Adjust the float valve FV-18 (para 2-4d(5)).

Step 2. Check if lamp is burned out.

Replace a burned out lamp.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

7. ERDLATOR TANK FAILS TO DELIVER DESIRED QUANTITY OR QUALITY OF WATER

Step 1. Check for correct chemical doses.

Adjust the chemical doses (para 2-5c(1)).

Step 2. Check for correctly positioned control valves.

Adjust control valves CV-9, CV-10, CV-11, and BPV-12 (para 2-4c(8), (9), and 2-4b(1)).

Step 3. Check for correctly positioned control valves in sludge concentrator tank.

Adjust control valves CV-16 and CV-17 (para 2-5b(3)).

Step 4. Check for excessive slurry in the erdlator tank above the slurry weir box take-off port.

Adjust control valves CV-17 andDV-21 (para 2-5b(3)).

Step 5. Check for banking of slurry blanket rotation or too much slurry blanket motion.

Decrease agitator mixing speed (para 2-5b(2)).

Step 6. Check for boiling appearance of slurry pool.

Drain and clean the erdlator tank.

Step 7. Check for large flock particles and foam floating on the water in the erdlator, caused by inadequate agitator mixing speed or tiny air leaks on the suction side of the raw water pump that introduces minute quantities of dissolved gases with the raw water.

Increase the agitator mixing speed (para 2-5b(2)) and tighten suction hose connections. No air bubbles should be visible in the raw water sight indicator SG-1.

Step 8. Check if water above slurry pool appears cloudy or gray.

Increase ferric Chloride dosage (para 2-5c(1)).

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

7. ERDLATOR TANK FAILS TO DELIVER DESIRED QUANTITY OR QUALITY OF WATER - Cont

Step 9. Check if water above slurry pool appears red iron color.

Decrease ferric chloride dosage (para 2-5c(1)).

Step 10. Check if water above slurry pool is clear but large fluffy flock particles rise.

Increase the limestone dosage (para 2-5c(1)).

Step 11. Check if effluent launder is properly adjusted.

When the water in the erdlator tank (10, fig. 2-35) begins to overflow into the effluent launder (13), level the effluent launder by turning the three effluent launder leveling rods (15) until water is flowing uniformly throughout the entire circumference of the effluent launder.

8. SLUDGE CONCENTRATOR TANK FAILS TO CONTROL SLURRY BLANKET

Step 1. Check for slurry blanket rising above top of circular blanket.

Adjust drain valve DV-21 (para 2-5b(3)).

Step 2. Check for control valves improperly adjusted.

Adjust control valves CV-16 and CV-17 (para2-5b(3)).

9. WET WELL TANK FAILS TO DELIVER SUFFICIENT WATER

Step 1. Check for control valves improperly positioned.

Adjust control valve CV-17 and drain valve DV-21 (para 2-5b(3)).

Step 2. Check if erdlator tank fails to deliver desired quantity of water.

Refer to MALFUNCTION 7.

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. WET WELL TANK FAILS TO DELIVER SUFFICIENT WATER - Cont

Step 3. Check if filter pump assembly fails to pump water.

Refer to MALFUNCTION 10.

10. FILTER PUMP ASSEMBLY FAILS TO PUMP WATER

Step 1. Check if valves are improperly positioned.

Adjust control valves CV-34 and three-way plug valves CV-36 (para 2-4e(1)).

Step 2. Check if slurry pool remains too high in erdlator tank; input flow rate is excessive.

Adjust control valve CV-9 to fix the rate of flow indicator reading at 25 gpm (para 2-4d(5)).

Step 3. Check for no rotation in the slurry pool at maximum agitator speed.

Adjust control valve CV-9 to fix the rate of flow indicator reading at 20 gpm.

Step 4. Check if draincock is open.

Close the draincock DC-47.

Step 5. Check if air leaks in piping.

Tighten loose pipe connections.

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MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

11. FILTER ELEMENTS WILL NOT TAKE PRECOAT

Step 1. Check if valves are improperly positioned.

Adjust valves CV-36, CV-40, CV-46, DV-48 (para 2-4e).

Step 2. Check if filter elements are clogged.

Bachwash the filter elements (para 2-5h) or remove filter elements and clean manually.

Step 3. Check if filter elements are damaged.

Repair or replace the filter elements (para 3-25).

Step 4. Check if filter pump assembly fails to deliver water.

Refer to MALFUNCTION 10.

12. EFFLUENT PRESSURE GAGE READING DROPS FASTER THAN USUAL.

Step 1. Check for incorrectly positioned control valves.

Adjust control valve CV-40 and draincock DC-43 (para 2-4 e(1)).

Step 2. Check if filter elements are clogged.

Backwash the filter elements (para 2-5h).

Step 3. Check if erdlator tank fails to deliver desired quality of water.

Refer to MALFUNCTION 7.

Step 4. Check for loose pipe connections.

Tighten pipe connections.

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

13. INFLUENT GAGE READING IS LOWER THAN USUAL

Step 1. Check if draincock is improperly positioned.

Fully open the draincock DC-41 (para 2-4e (1)).

Step 2. Check if filter pump assembly fails to deliver water.

Refer to MALFUNCTION 10.

Step 3. Check if filter elements are clogged or damaged.

Backwash filter elements (para 2-5h) or replace if defective (para 3-25).

14. DIATOMITE FILTER RUNS ARE TOO SHORT OR TOO LONG

Step 1. Check if flow control valve is incorrectly positioned.

Adjust the flow control valve CV-45 (para 2-5b(4)).

Step 2. Check for incorrect dosage of diatomite slurry.

Adjust the diatomite slurry feed variator FEI-5 (para 2-5c(1) (f) and (g)).

Step 3. Check if erdlator tank fails to deliver desired quantity or quality of water.

Refer to MALFUNCTION 7.

Step 4. Check if filter elements are clogged or insufficiently precoated.

Backwash filter elements (para 2-5h).

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

15. DIATOMITE FILTER ASSEMBLY WILL NOT DELIVER WATER

Step 1. Check for incorrectly positioned valves.

Adjust valves CV-36, CV-37, CV-40, CV-45 and CV-50 (para 2-4e).

Step 2. Check if filter pump assembly fails to deliver water.

Refer to MALFUNCTION 10.

Step 3. Check if filter elements are clogged or improperly precoated or filter cake broken.

Backwash and coat the filter elements (para 2-5h).

Step 4. Check if filter elements are defective.

Repair or replace the filter elements (para 3-25).

Step 5. Check for loose valves and piping.

Tighten loose pipe connections.

16. FILTERED WATER IS NOT POTABLE OR PALATABLE

Step 1. Check if there is suspended material visible in filtered water.

Backwash the filter elements (para 2-5h).

Step 2. Check if filtered water is cloudy.

Backwash the filter elements (para 2-5h).

Step 3. Check if filtered water has objectionable color, taste or odor.

Add activated charcoal to slurry feeder limestone compartment (para 2-4b(8)).

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

16. FILTERED WATER ISNNOT POTABLE OR PALATABLE - Cont

Step 4. Check if chlorine residual of filtered water is different from that prescribed by the medical officers.

Adjust calcium hypochlorite feed variator FEI-8 (para 2-5c(1)(e)).

17. WASTE WATER WILL NOT DRAIN OUT OF VAN

Step 1. Check if drain hoses are too high, kinked, or damaged.

Lower the drain hoses, remove kinks, or replace if damaged.

Step 2. Check if drain valves are incorrectly positioned for operation.

Adjust drain valves DV-21 and DV-23 (para 2-6b).

Step 3. Check if drain valves and draincocks are incorrectly positioned for stopping.

Adjust the drain valves and draincocks (para 2-6a).

Step 4. Check for clogged waste water tank.

Clean the waste water tank.

Step 5. Check for loose valves, piping and hoses.

Tighten loose connections.

Table 3-2. Operator Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

18. CLEARANCE MARKER LIGHTS INOPERATIVE

Step 1. Check if switch in truck chassis cab is in OFF position.

Turn clearance marker light switch ON.

Step 2. Check if electrical connections are loose between truck chassis and water purification unit.

Tighten loose electrical connections.

Step 3. Check for burned out clearance marker lamp.

Refer to organizational maintenance.

19. VAN CEILING LIGHTING FIXTURE INOPERATIVE.

Check for burned out lamp in van ceiling lighting fixture.

Refer to organizational maintenance.

20. VAN BODY LEAKS DURING RAINY OR BLACKOUT OPERATION.

Check if ventilating window is open. Check if bonnet doors or roof hatch are open.

Close the ventilating window. Close the bonnet doors or roof hatch.

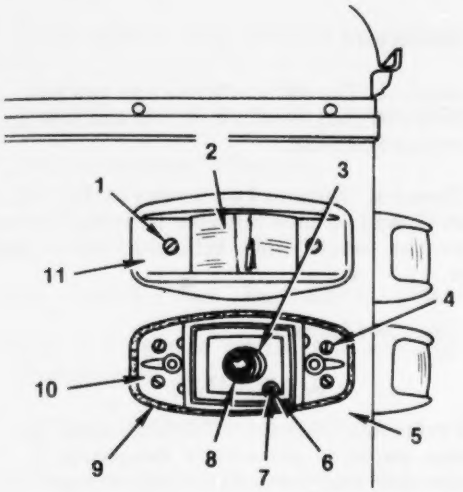

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Figure 3-2. Clearance Marker Lights

Legend for figure 3-2:

1. Screw, machine, No. 10-24 x 3/8 in. (16)
2. Lens
3. Grommet and wire assembly (8)
4. Screw, tapping, thd-cutting No. 10-12 x 5/8 in. (32)
5. Van body
6. Washer, flat, No. 6 (8)
7. Screw, machine, No. 6-32 x 5/6 in. (8)
8. Lamp, incandescent, 3 cp, 24 v (8)
9. Preformed felt (8)
10. Lampholder base (8)
11. Door (8)

(1) Clean all parts of stowage racks with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Clean leveling jack assemblies inside and out with cleaning solvent (item 1, App. E). The screw (6, fig. 3-4) may be removed from extensions part of the leveling jack assembly in order to remove foreign material that has entered cylinder of the leveling jack assembly.

b. Lubrication.

(1) Remove all foreign material from surfaces.

(2) Always lubricate leveling jack assemblies after cleaning.

3-10. Van Body Assembly.

a. Inspection. Inspect van body for broken windows, damaged or broken clearance lights, defective hinges and latches, and other damage.

b. Cleaning.

WARNING

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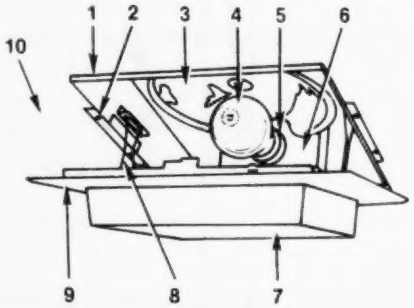

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Figure 3-3. Van Ceiling Light Fixture

Legend for figure 3-3:

1. Housing
2. Screw, thd-forming, No. 8-18 x 3/4 in. (3)
3. Reflector
4. Incandescent lamp, 60 watt
5. Lamp receptacle
6. Receptacle housing
7. Glass panel
8. Door springs (2)
9. Door frame
10. Van ceiling

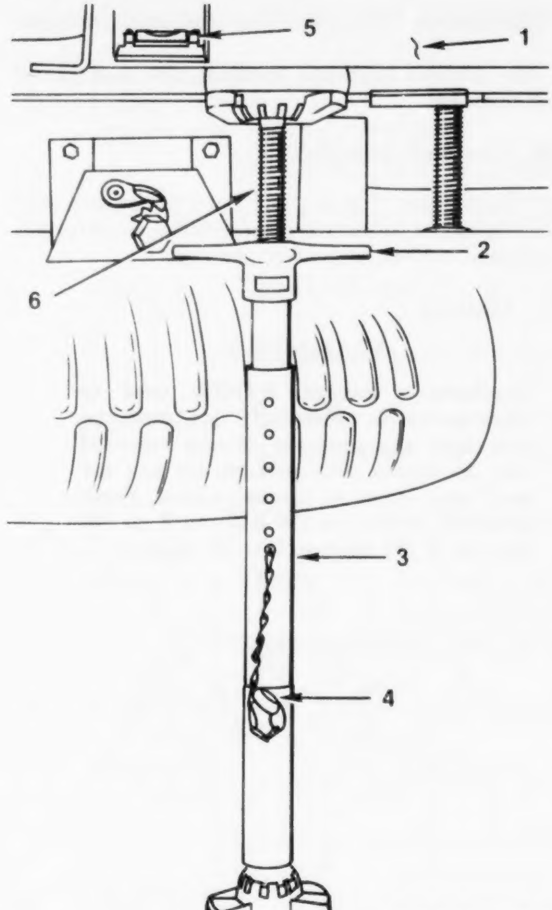

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Figure 3-4. Leveling Jack, Installed

Legend for figure 3-4:

1. Van body
2. Hand nut (4)
3. Leveling jack assembly
4. Pin (spec) (4)
5. Level (3)
6. Screw

(1) Clean all door hinges, latches and cables with cleaning solvent (item 1, App. E).

(2) Dry thoroughly.

c. *Lubrication.* Every 50 hours, clean and lightly coat all door hinges, latches and cables with OEA/APG-PD-1 lubricant (refer to lubrication order, fig. 3-1).

3-11. Reflectors.

a. *General.* The eight reflectors on van body consist of four red ones mounted on rear and four amber ones mounted on front.

b. *Removal.* Remove two screws (3, fig. 3-5) and washers (2) and remove reflector (1) from van body. Remove the seven other reflectors in a similar manner.

c. *Clean and Inspect.*

WARNING

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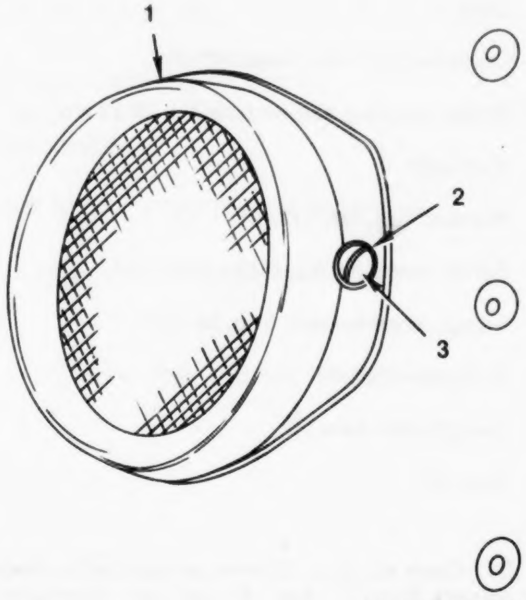

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Figure 3-5. Reflector

Legend for figure 3-5:

1. Reflector
2. Washer, lock, 1/4 in. (2)
3. Screw, self-tapping, No 10 1/2 in. (2)

(1) Clean reflector with cleaning solvent (item 1, App. E).

(2) Inspect for broken glass and damaged frame.

(3) Replace damaged reflectors.

d. *Installation.* Install reflector (1) on van body and secure with screws (3) and washers (2).

3-12. Data Plates and Instruction Holders.

a. Inspect data plates for illegible wording or other damage (refer to fig. 1-6).

b. Inspect instruction holders for cracks or tears.

c. Replace damaged data plates or instruction holders.

3-13. Accessories.

a. *General.* These are accessories to place end item in an operational mode, to cause it to function as intended, and to perform emergency repairs which cannot be deferred until completion of mission. These accessories are illustrated in figure 3-6.

b. *Replace.* Check accessories for serviceability and replace when found to be unserviceable.

3-14. Motor Assemblies.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean motor assemblies, pulleys and junction box covers with cleaning solvent (item 1, App. E) and dry thoroughly. Wipe cables with a clean, dry cloth.

b. Inspect pulleys for cracks, breaks, damaged screw threads, and nicks or burrs that may tear V-belt. Remove nicks and burrs from pulleys or replace pulleys if otherwise unserviceable.

c. Inspect cables, connector covers and grommets for cracks, breaks, corrosion or deterioration.

d. Inspect motor assemblies for evidence of being burned and for a bound or restricted drive shaft.

3-15. Motor Frame Supports and Housing.

a. To adjust frame supports, loosen motor mount capscrews.

b. Position motor until V-belt can be depressed approximately 1/2 inch midway between pulleys.

c. Tighten motor mount capscrews.

3-16. Slurry Feeder Drivebelt.

a. To adjust slurry feeder drivebelt, loosen motor mount capscrews.

b. Position motor until V-belt can be depressed approximately one inch midway between pulleys.

c. Tighten motor mount capscrews.

3-17. Magnetic Motor Starters.

a. Clean motor starters and overload relays with a clean, dry cloth.

b. Clean corrosion from terminals.

3-18. START and STOP Control Switches.

a. Clean START and STOP switches with a clean, dry cloth.

b. Inspect for loose mounting or loose parts.

3-19. Ground Rod Assembly.

a. This assembly consists of a 30 inch (76 cm) metal ground rod and a number 6 size bare copper cable.

b. Check rod and cable for cuts, nicks, or other damage that would affect electrical conductivity.

c. Replace damaged or defective parts.

3-20. Raw Water Rate of Flow Indicator.

a. *General.* The rate of flow indicator is mounted on the top front of the erdlator tank by a mounting bracket and indicates, in gallons per minute, amount of water being introduced into erdlator tank.

b. *Cleaning and Inspection.*

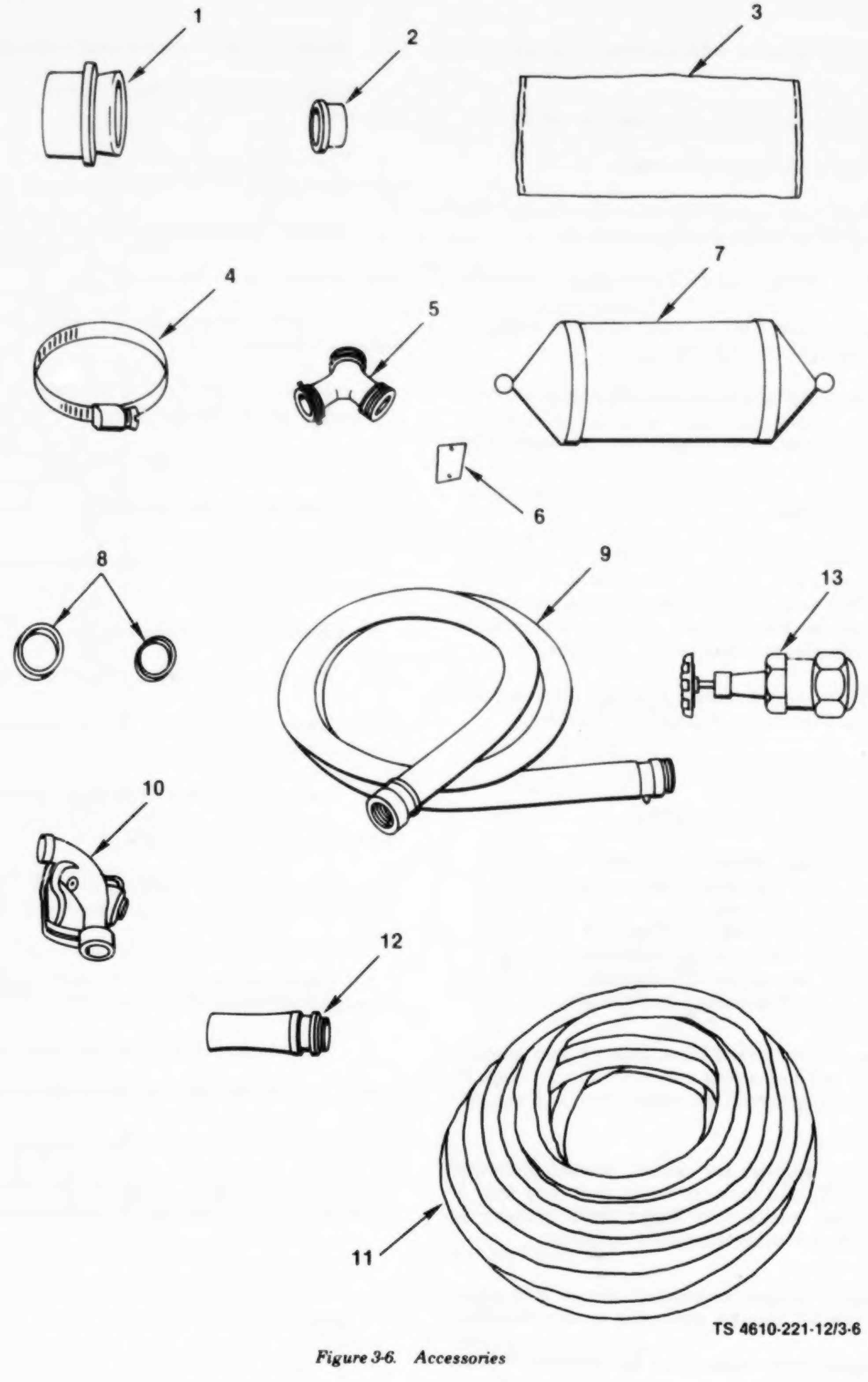
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Figure 3-6. Accessories

Legend for figure 3-6:

1. Hose adapter
2. Pipe cap
3. Publications case
4. Filter element sleeve hose clamp
5. Siamese connection
6. Blind flange
7. Source water supply float
8. Hose gasket
9. Water hose
10. Nozzle
11. Power cable
12. Strainer
13. Valve

WARNING

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(1) Clean indicator with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect for cracks, breaks, leaks, loose pointer and illegible markings.

c. *Adjustment.*

(1) Ensure that there is no water flow through raw water piping.

(2) Open door (2, fig. 3-7) of rate of flow indicator.

(3) Adjust setscrew (1) until pointer (3) coincides with reference mark on indicator scale.

(4) Close door of indicator.

(5) Adjustment is not applicable to water purification units, serial numbers 816-1083.

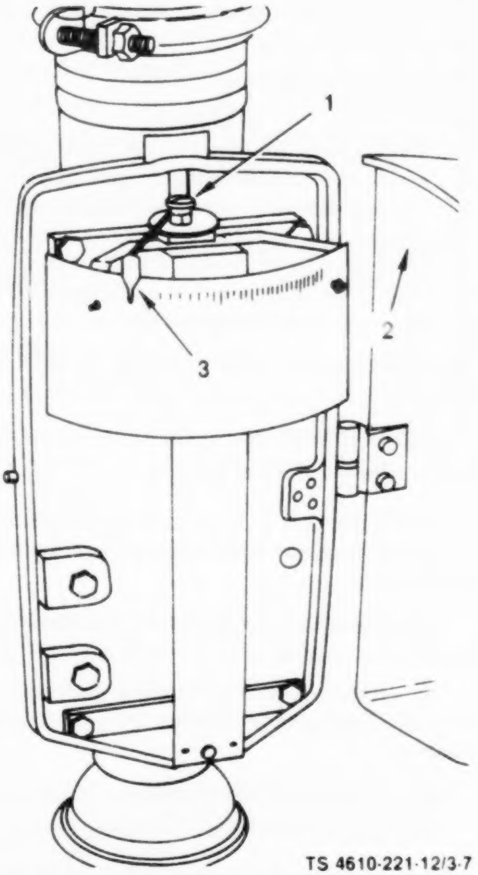

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Figure 3-7. Rate of Flow Indicator Adjustment

Legend for figure 3-7:

1. Adjustment screw
2. Door
3. Pointer

3-21. Slurry Feeder Assembly.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean metal parts of slurry feeder tank with cleaning solvent (item 1, App. E) and flush thoroughly with clean water. A wire brush may be used to aid removal of mineral deposits. Pay particular attention to cleaning screens and orifice plugs.

b. Clean plastic windows with a solution of soap and warm water and rinse thoroughly with clear water.

3-22. Chemical Solution Feeder.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean parts with cleaning solvent (item 1, App. E).

b. Dry thoroughly.

3-22.1 Chemical Feed Pumps.

a. Removal.

(1) Cut outlet hoses two to four inches above outlet ports.

(2) Remove and retain hose clamps from outlet ports.

(3) Remove four mounting bolts at base of chemical feed pump. Retain two nuts, bolts, and washers.

(4) Unplug electrical cable.

(5) Remove chemical feed pump.

b. L-Bracket Fabrication for 1500 and 3000 Erdlator.

(1) Cut 10 gauge sheet steel to 5-inch x 9-inch rectangle.

(2) Establish centerline parallel to 9-inch side and mark.

(3) Measure two inches from one 5-inch edge and draw line parallel to 5-inch edge.

(4) Place metal in vice so that mark (2-inches from 5-inch edge) is even with top of vice jaw.

(5) Bend metal to 90 degree angle to form "L" shaped bracket.

(6) On long (top) leg of bracket, lay out and drill two 5/16-inch holes one inch from 5-inch edge (top). Holes must be equidistant from centerline 3-1/2 inches (on center) apart.

(7) On short leg (bottom) of bracket, layout and drill two 5/16-inch holes one inch from 5-inch edge. Holes should be equidistant from centerline 4-inches (on center) apart.

(8) Remove all burrs, sharp edges, and sharp corners.

(9) Degrease and derust bracket.

(10) Paint bracket, as required.

c. Disassembly. The chemical feed pump does not require disassembly; only replacement.

d. L-Bracket Installation.

NOTE

All directions given are as seen by a person standing on the centerline of the vehicle, looking at the chemical feed pump. The door must be at the viewer's left.

(1) Align centermost set of holes in table (where old pump was removed) with two holes in short leg of bracket.

(2) Insert two mounting bolts, retained from old pump, and tighten in place.

(3) Remove plastic bracket from new chemical feed pump by turning captive 1/4 x 20 bolts at top rear of assembly until they can be removed from plastic bracket.

(4) Align captive bolts with two holes on top of long leg of "L" shaped bracket, push captive bolts through holes, and secure with 1/4 x 20 nuts.

e. Chemical Feed Pump Installation.

NOTE

All directions given below are to be done on one side of the pump and then repeated for the other side.

(1) To assemble foot valves and inlet tubes:

(a) Cut inlet tube (P/N C-334) to 30 inch length.

(b) Remove cap from top of foot valve; making sure that only topmost part of foot valve is removed.

(c) Slip hose through cap.

(d) Fit inlet hose end over extruded portion of foot valve.

(e) Tighten cap.

(2) To install inlet tube and foot valve assembly on inlet side (bottom) of chemical feed pump:

(a) Remove dust plugs from extruded portion on inlet port.

(b) Remove cap; making sure to remove only topmost portion of inlet port.

(c) Slip tube through cap.

(d) Install inlet tube on extruded portion of inlet ports.

(e) Tighten cap in place.

(3) Cut outlet tube (P/N C-335) to length of 6 to 8 inches.

(4) To install output tubes on outlet ports:

(a) Remove dust plugs from extruded portion of outlet port.

(b) Remove cap; making sure to remove topmost part of assembly.

(c) Install outlet tube on extruded portion of outlet ports.

(d) Slip cap over end of outlet tube and down on outlet port.

(e) Tighten cap.

(5) To install 1/4 x 1/2 adapter:

(a) Insert large end of adapter into old outlet tube.

(b) Install hose clamps retained from removal of old chemical feed pump; taking care not to crush these adapters when tightening hose clamps.

(c) Tighten hose clamps.

(d) Slip new hose clamps (NSN 4730-01-146-6992) over outlet tube.

(e) Install 1/4 x 1/2 adapter (small end) in outlet tube.

(f) Move hose clamp into position and tighten in place; taking care not to crush adapter.

(6) Locate electrical box (located below shelf holding chemical feed pump).

(7) Remove cover from electrical box, and remove wires from poles inside box.

(8) Loosen retainer cap at electrical box end.

(9) Remove wire, cap, and grommet.

(10) Remove cap and grommet from wire.

(11) Cut plug from wire on new chemical feed pump.

(12) Run wire to electrical box, securing with one wire tie to table leg.

(13) Measure wire leading to electrical box, and allow four to six extra inches. Cut off excess wire.

(14) Strip outer insulation back two inches.

(15) Strip inner insulation back 3/4-inch.

(16) Place retaining cap and grommet on wire and add several layers of electrical tape to area of wire that fits through grommet.

(17) Feed wire through end of electrical box (where old wire was removed) to point where stripped wire ends can be connected to poles.

(18) Connect green wire to ground pole.

(19) Connect other two wires to other poles; try to maintain color continuity wherever possible.

(20) Move grommet and retainer cap into position and tighten.

(21) Reinstall electrical box cover.

3-23. Poppet Valves, Seat Gaskets, and Diaphragm.

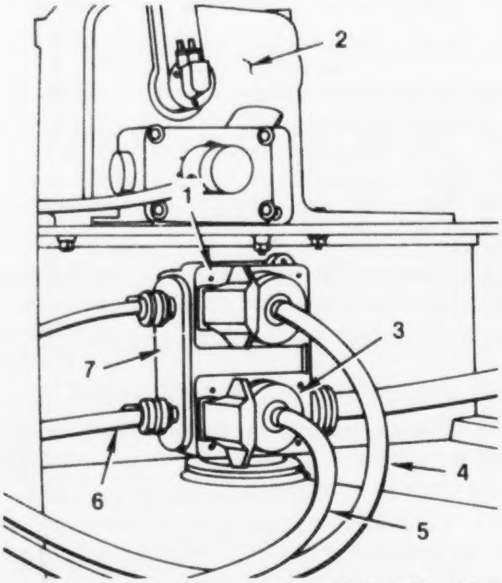
a. Removal.

(1) Disconnect electrical cable assembly from right side of chemical solution feeder assembly (8, fig. 2-8).

(2) Loosen four hose clamps (5) and disconnect plastic tubes from chemical solution feeder assembly.

(3) Remove four bolts (9) and remove chemical solution feeder assembly (8) from slurry feeder frame (10).

(4) Disconnect electrical cable from terminal board in twist-lock receptacle box (7, fig. 3-8) and withdraw cable from receptacle.



TS 4610-221-12/3-8

Figure 3-8. Twist-Lock Receptacle Connectors

Legend for figure 3-8:

1. Twist-lock receptacle connector (raw water pump)
2. Chemical solution feeder assembly
3. Twist-lock receptacle connector (distribution pump)
4. Cable
5. Cable
6. Cable-slurry feeder motor
7. Receptacle box

b. Disassembly.

(1) Remove drainplug (33, fig. 3-9) and drain oil from chemical solution feeder into a suitable container.

(2) Loosen body clamping screw (15).

(3) Unscrew screw and pin assembly (24, 25). Remove four nuts (26) and washers (27) that hold bell (23) to pump (10).

(4) Remove and separate bell (23), plate (22), yoke (21), pump (10), diaphragm (9) and plate (8) from feeder (34).

(5) Remove intake valve bodies (14), gaskets (11), pump poppet valves (13) and valve seats (12) from pump (10).

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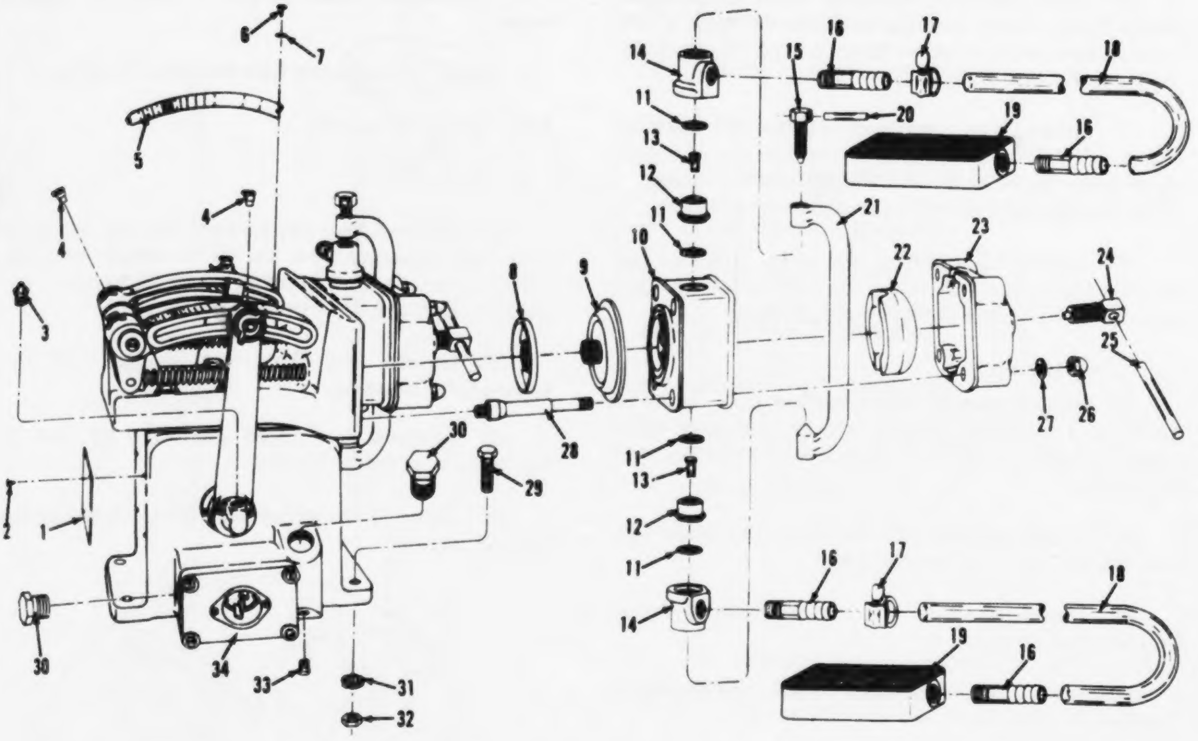


TS 4610-221-12/3-9

Figure 3-9. Chemical Solution Feeder Assembly, Exploded View

Legend for figure 3-9:

1. Plate
2. Screw
3. Fitting
4. Cup
5. Plate
6. Screw
7. Washer
8. Plate
9. Diaphragm
10. Pump
11. Gasket
12. Seat
13. Valve
14. Valve body
15. Screw
16. Nipple
17. Clamp
18. Hose
19. Strainer
20. Pin
21. Yoke
22. Plate
23. Bell
24. Screw
25. Pin
26. Nut
27. Washer
28. Stud
29. Screw
30. Plug
31. Washer
32. Nut
33. Plug
34. Feeder

(6) Remove other pump and attached parts in a similar manner.

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean chemical solution feeder assembly and metal parts with cleaning solvent (item 1, App. E) and dry thoroughly.

WARNING

Hydrochloric acid can cause severe skin burns and damage to eyes. Handle it with care and avoid breathing its fumes. If solution should come into contact with eyes or skin, rinse immediately with clean water and consult a doctor.

(2) Clean mineral deposits from diaphragm, pump body, valve bodies, and valves with a 5% hydrochloric acid solution (item 2, App. E) or cleaning solvent (item 1, App. E).

(3) Inspect the pump body and valve bodies for cracks, breaks, cuts, and deterioration. Inspect valve seats in the body and valve body for excessive wear. Replace any defective or unserviceable part.

(4) Inspect diaphragm for cuts, breaks, and deterioration. Inspect screw threads of diaphragm for damage. Replace defective diaphragm.

d. *Reassembly*

(1) Install intake valve bodies (14, fig. 3-9), gaskets (11), pump poppet valves (13) and valve seats (12) onto pump (10). Secure with yoke (21) and screw (15).

(2) Install diaphragm (9), plate (8), plate (22) and bell (23) onto the feeder (34).

(3) Insert four nuts (26) and washers (27) onto bell (23) and tighten.

(4) Install and tighten screw and pin assembly (24, 25).

(5) Tighten body clamping screw (15).

(6) Assemble other pump and its parts in a similar manner.

(7) Service feeder with oil by removing plug (30), filling with oil and inserting plug (30).

e. *Installation.*

(1) Connect electrical cable to terminal board in twist-lock receptacle box.

(2) Position chemical solution feeder assembly (8, fig. 2-8) on slurry feeder frame (10) and secure with four bolts (9).

(3) Connect four plastic tubes (4) to chemical solution feeder assembly and secure each tube with a hose clamp (5).

(4) Connect cable assembly to chemical solution feeder assembly.

3-24. Diatomite Filter Housing and Housing Cover.

a. Clean all parts of filter housing and cover with a solution of soap and water, paying particular attention to removing mineral deposits from within filter housing.

b. Thoroughly rinse all parts with clear, filtered water.

c. Make sure all soap film has been removed.

3-25. Filter Elements.

a. Removal.

(1) Remove two capscrews (15, fig. 2-30) and nuts and separate two halves of clamp assembly (16) that secure filter housing cover (2) to filter housing (17). Remove filter housing cover.

(2) Loosen two capscrews (2, fig. 3-10) that secure filter housing.

(3) Remove preformed packings (6, and 10, fig. 3-11) from filter element.

(4) Remove the other five filter elements in a similar manner.

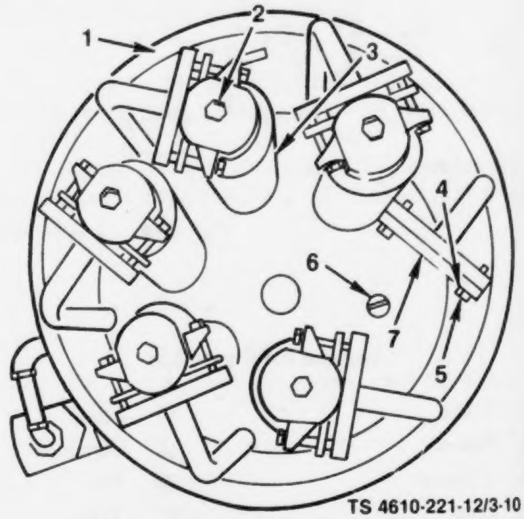
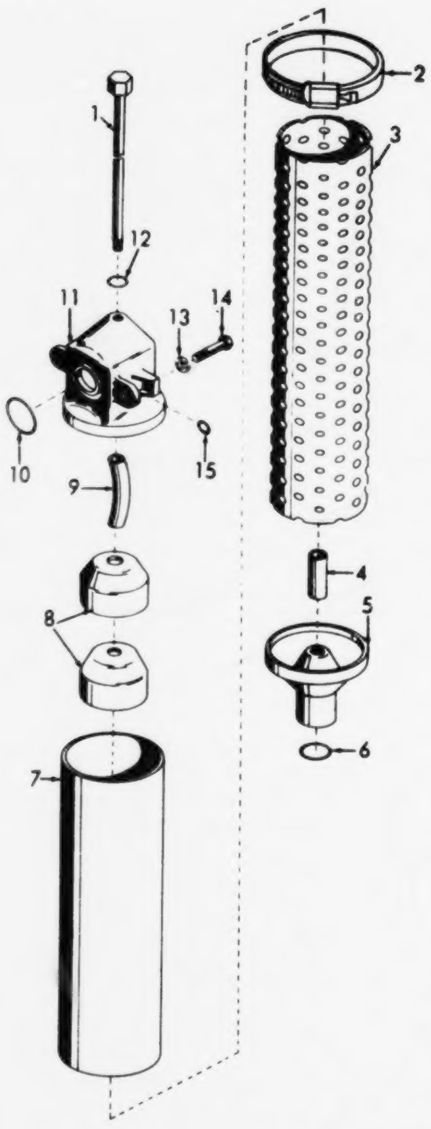


Figure 3-10. Filter Element, Removal

Legend for figure 3-10:

1. Filter housing
2. Screw, cap, hex hd, 3/8-16 x 2 1/4 in. (12)
3. Filter element (6)
4. Washer, lock, 3/8 in. (12)
5. Screw, cap, hex hd, 3/8-16 x 1 1/4 in. (12)
6. Cap, pipe, 1/2 in. (6)
7. Adapter plate (6)



TS 4610-221-12/3-11

Figure 3-11. Filter Element, Exploded Views

Legend for figure 3-11:

1. Tie rod (6)
2. Hose clamp (12)
3. Perforated metal tube (6)
4. Metal spacer (6)
5. Lower bracket (6)
6. Preformed packing (6)
7. Plastic membrane sleeve (6)
8. Plastic cup (12)
9. Plastic spacer (6)
10. Preformed packing (6)
11. Upper bracket (6)
12. Preformed packing (6)
13. Washer, lock, 3/8 in. (12)
14. Screw, cap, 3/8-16 x 2 1/4 in. (12)
15. Retaining ring (6)

b. Disassembly.

(1) Remove retaining ring (15, fig. 3-11) that secures the two capscrews (14) and remove two capscrews and lockwashers (13) from upper brackets (11).

(2) Remove tie rod (1) and preformed packing (12) and separate lower bracket (5) and metal spacer (4) from one end of perforated metal tube (3), and upper bracket (11) and plastic spacer (9) from other end of perforated metal tube.

(3) Remove 12 plastic cups (8) from within perforated metal tube.

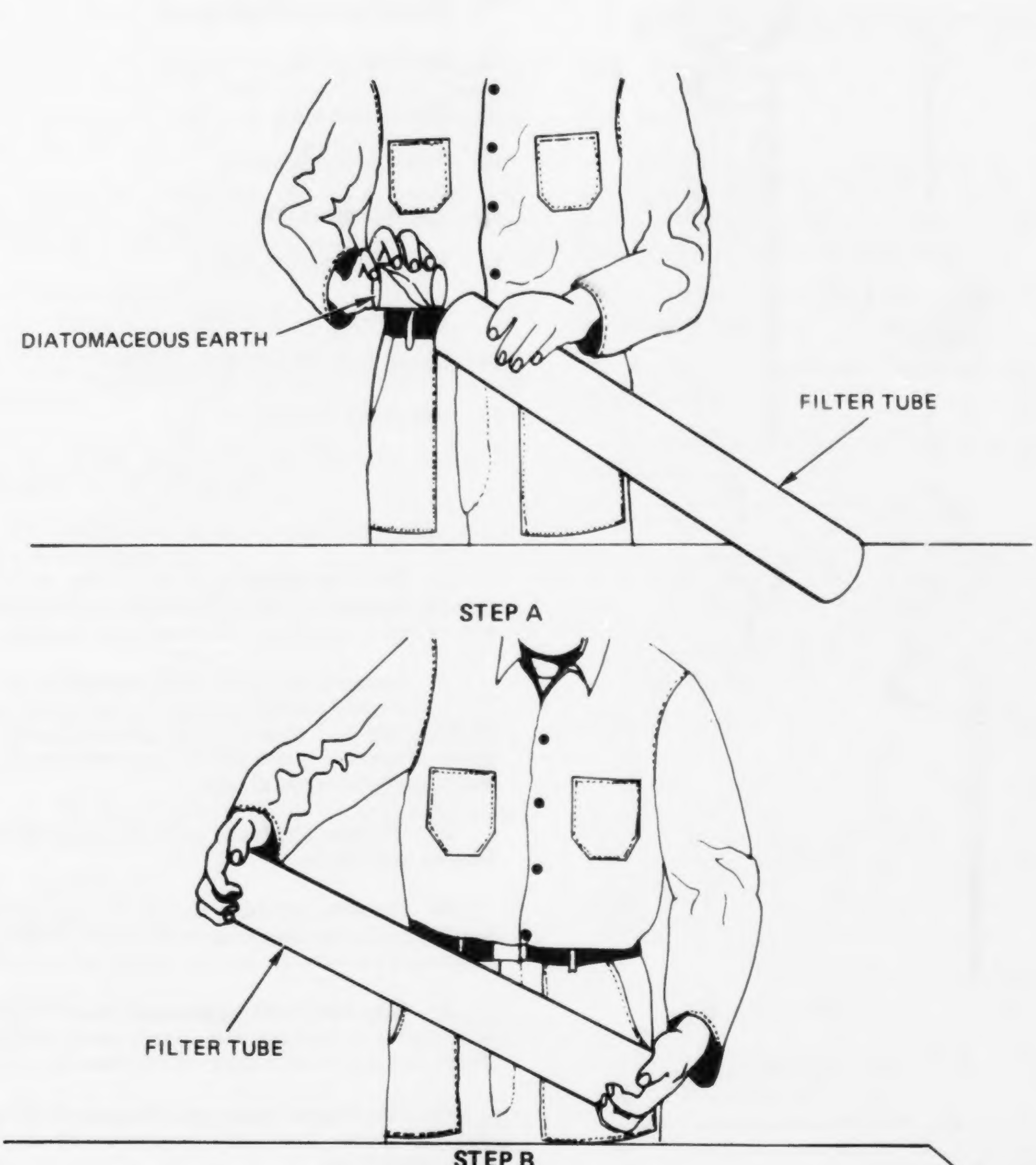
(4) Remove two hose clamps (2) and deposit a handful of diatomaceous earth into tube as illustrated in figure 3-12, view A.

(5) Grip both ends tightly and shake vigorously to distribute diatomaceous earth over interior of sleeve as illustrated in figure 3-12, view B.

(6) Slip fingers under one flanged end of sleeve and slip sleeve from tube as illustrated on figure 3-12, views C and D.

(7) If sleeve is to be replaced with another sleeve, sleeve can be torn from tube.

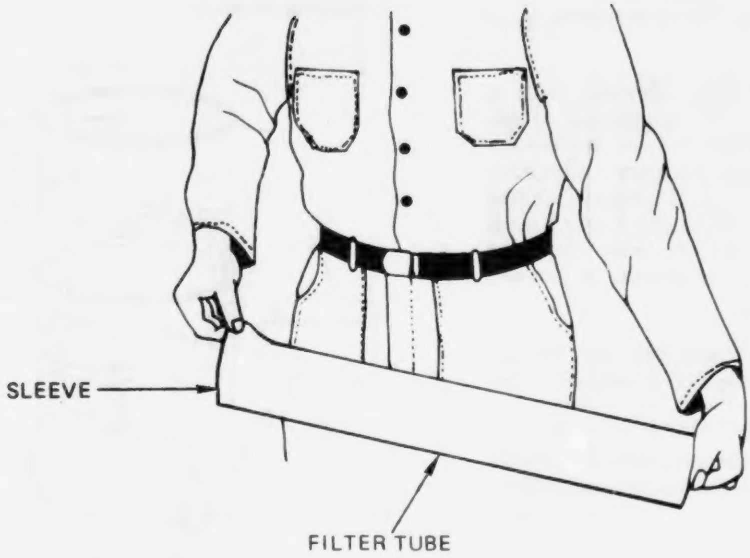
(8) Disassemble the remaining five filter elements in a similar manner.


DIATOMACEOUS EARTH
FILTER TUBE
STEP A
FILTER TUBE
STEP B

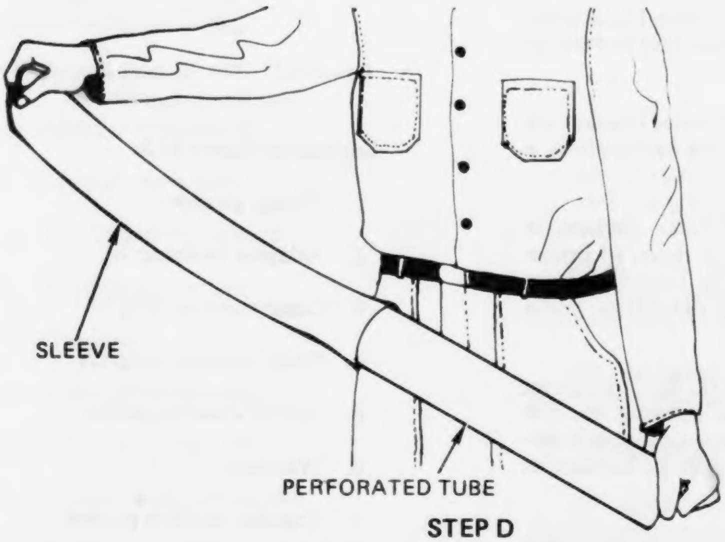
A. Depositing diatomaceous earth in sleeve.
B. Distributing diatomaceous earth in tube.

TS 4610-221-12/3-12 ①

Figure 3-12. Filter Sleeve, Removal (Sheet 1 of 2)


SLEEVE
FILTER TUBE

STEP C


SLEEVE
PERFORATED TUBE

STEP D

C. Loosening sleeve
D. Removing sleeve from tube

TS 4610-221-12/3-12 ②

Figure 3-12. Filter Sleeve, Removal (Sheet 2 of 2)

c. Cleaning and Inspection.

WARNING

Use filtered water for cleaning filter elements and filter housing. Never use gasoline or other solvents.

(1) Clean all parts of filter element with a solution of soap and water. Pay particular attention to removing foreign material from perforated metal tube and plastic membrane sleeve. Cleaning may be aided with a wire brush. Thoroughly rinse all parts with clear, filtered water. Be sure all soap film has been removed. Whenever filter elements are cleaned, filter housing cover should be cleaned in same manner.

(2) Inspect preformed packings for cracks, breaks, and deterioration. Replace a defective preformed packing.

(3) Inspect plastic membrane sleeve for cracks and deterioration. Replace a defective membrane sleeve.

(4) Inspect plastic cups for miniature cracks. Replace a defective plastic cup.

(5) Inspect perforated metal tube for cracks, breaks, and dents. Replace a defective perforated metal tube.

(6) Inspect upper bracket and lower bracket for cracks, breaks, and damaged threads. Replace a defective upper or lower bracket.

d. Field Expedient Repair. If filter element is defective and cannot be repaired or replaced immediately, defective element may be removed from filter housing and suction and discharge ports capped off in following manner:

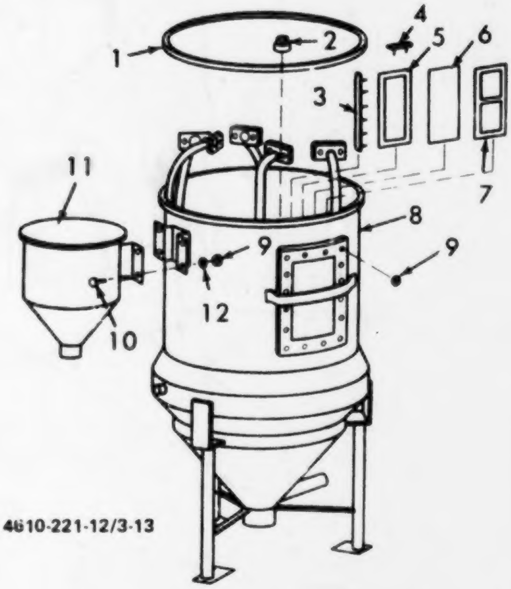
(1) **Remove adapter bushing (2, fig. 3-13) from discharge port in bottom of filter housing (8). For unit serial numbers 816-1083, remove adapter bushing (2, fig. 3-14) from discharge port in bottom of filter housing (7).**

(2) **Install pipe cap (6, fig. 3-10) on discharge port in bottom of filter housing (1).**

(3) **Install preformed packing (10, fig. 3-11) and adapter plate (7, fig. 3-10) over suction tube of filter housing and secure with two lockwashers (4) and capscrews (5).**

NOTE

Replace missing filter element as soon as possible and do not operate the diatomite filter assembly with more than two filter elements missing.

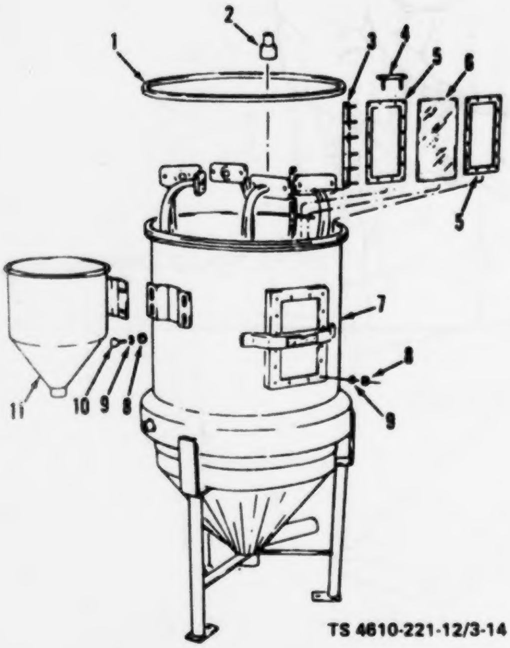


TS 4610-221-12/3-13

Figure 3-13. Filter Housing, Exploded View (All Units Except 816-1083)

Legend for figure 3-13:

1. **Flange gasket**
2. **Adapter bushing (6)**
3. **Long window strip (2)**
4. **Short window strip (2)**
5. **Inside window gasket**
6. **Window**
7. **Outside window gasket**
8. **Filter housing**
9. **Nut, hex, 1/2-20 (20)**
10. **Screw, cap, 1/4-20 x 5/8 in. (4)**
11. **Precoat funnel**
12. **Washer, lock, 1/4 in. (4)**



TS 4610-221-12/3-14

Figure 3-14. Filter Housing, Exploded View (Unit Serial Numbers 816-1083)

Legend for figure 3-14:

1. Flange gasket
2. Adapter bushing (6)
3. Long window strip (2)
4. Short window strip (2)
5. Window gasket (2)
6. Window
7. Lower filter housing
8. Nut, hex, 1/4-20 (20)
9. Washer, lock, 1/4 in. (20)
10. Screw, cap, 1/4-20 x 5/8 in. (4)
11. Precoat funnel

e. Reassembly.

(1) To install a new sleeve, deposit a handful of diatomaceous earth into filter element as illustrated on figure 3-15, view A.

(2) Grip both ends tightly and shake vigorously to distribute diatomaceous earth over interior of sleeve as illustrated on figure 3-15, view B.

(3) Distribute a similar amount of diatomaceous earth over tube as illustrated on figure 3-15, view C.

(4) Fold back approximately 1/2 inch (13 mm) on one end of sleeve for gripping and slip sleeve onto tube as illustrated on figure 3-15, view D.

(5) To install a previously used plastic membrane sleeve, it must be slid onto the perforated metal tube and secured with the two hose clamps (2, fig. 3-11).

NOTE

Do not roll or bend a previously used plastic membrane sleeve. The used plastic membrane sleeve becomes very brittle and cracks with the slightest provocation.

(6) Insert two plastic cups (8) inside perforated metal tube (3).

(7) Position metal spacer (4) and lower bracket (5) on bottom of perforated metal tube. Position plastic spacer (9) and upper bracket (11) on top of perforated metal tube and secure all components together with preformed packing (12) and tie rod (1).

CAUTION

Exercise extreme care when installing preformed packings. Do not tighten tie rod enough to crush or break plastic cups.

(8) Install two capscrews (14) and lockwashers (13) in upper bracket (11) and secure capscrews with retaining rings (15).

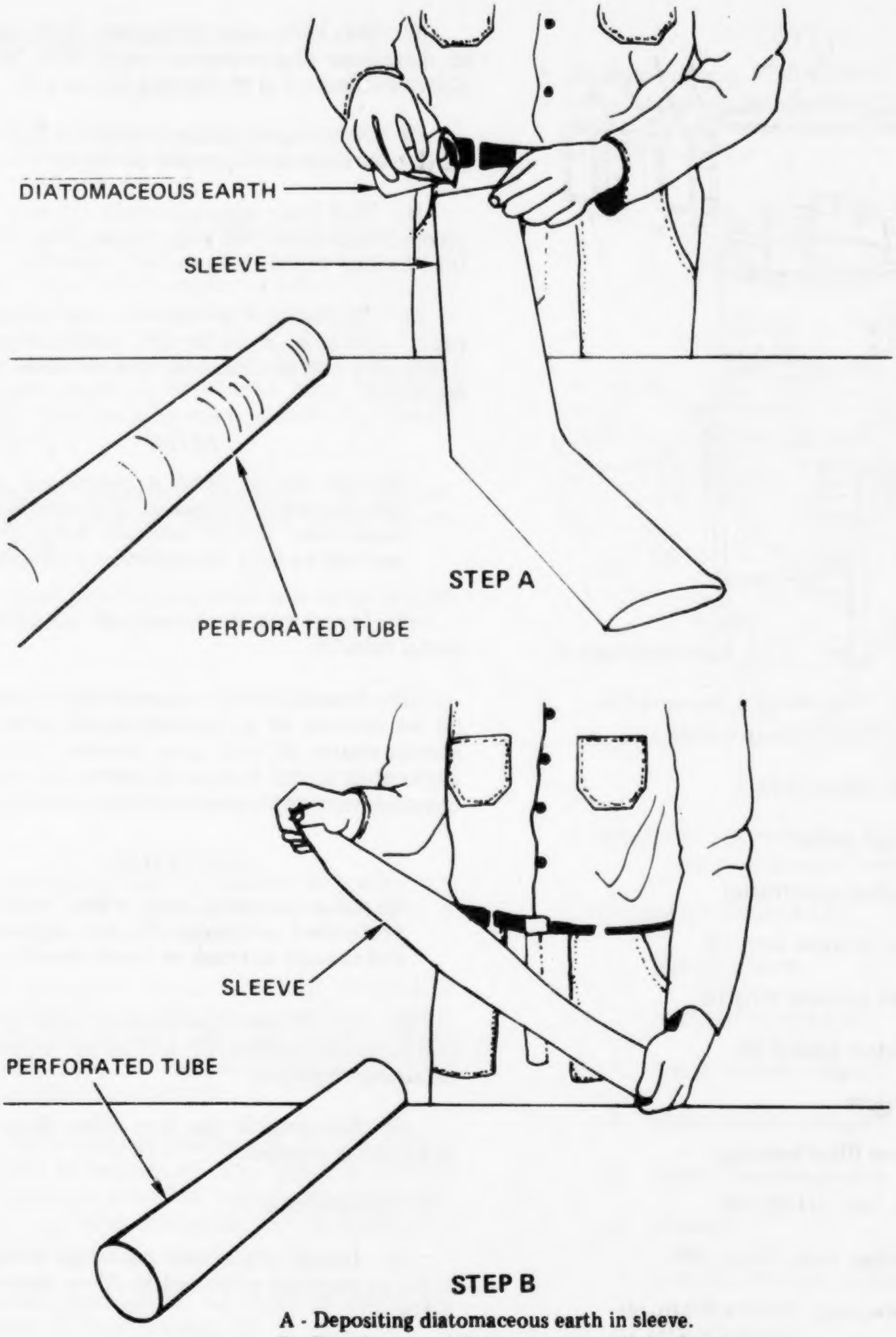
(9) Reassemble the five other filter elements in a similar manner.

f. Installation.

(1) Install preformed packings (6 and 10, fig. 3-11) in recesses provided in filter element (3, fig. 3-10).

(2) Position filter element (3) on adapter bushing in bottom of filter housing (1) and secure top of filter element to suction tube with two capscrews (2).

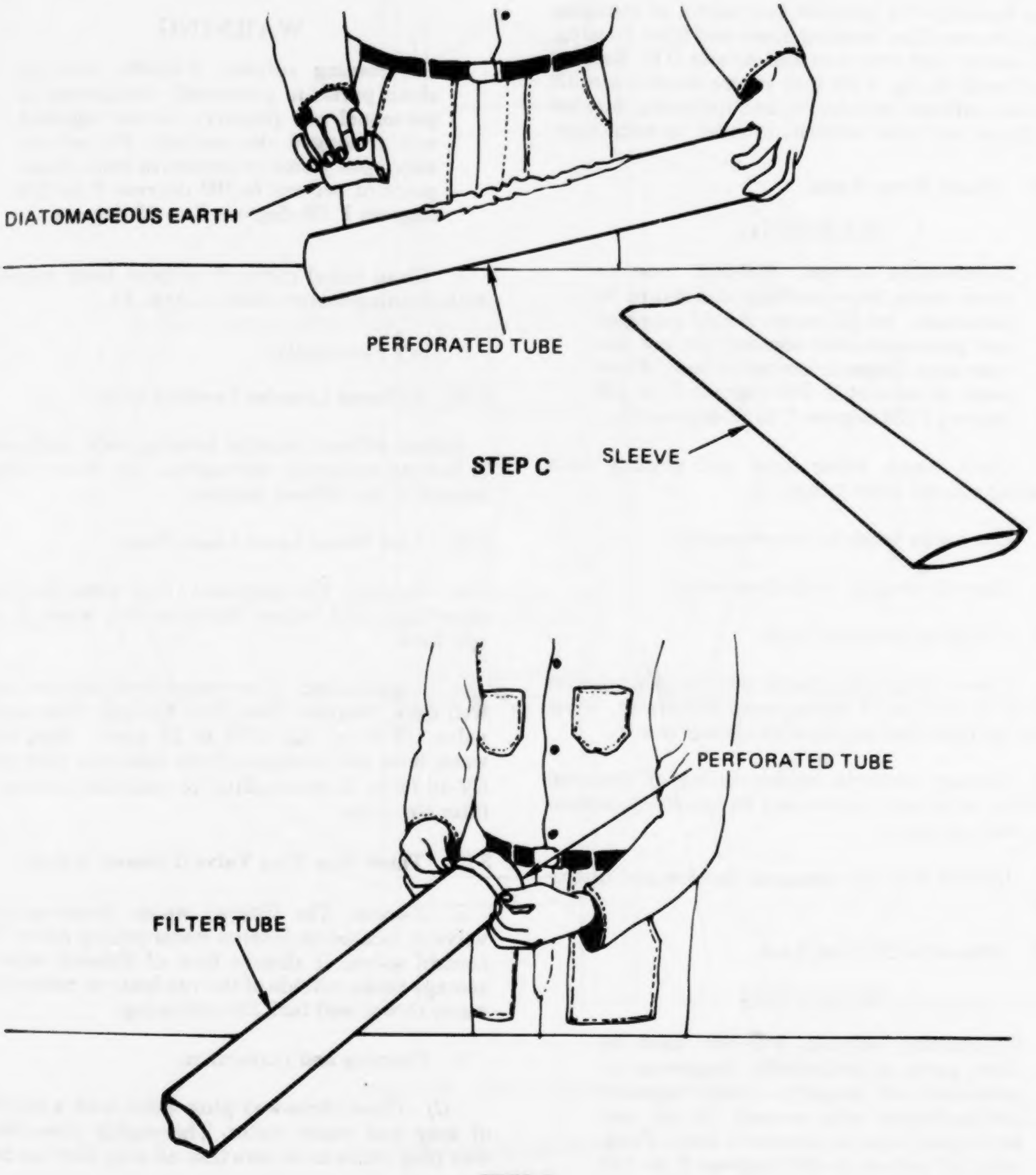
(3) Install the five other filter elements in a similar manner.


DIATOMACEOUS EARTH
SLEEVE
PERFORATED TUBE
STEP A
SLEEVE
PERFORATED TUBE
STEP B

A - Depositing diatomaceous earth in sleeve.
B - Distribution of diatomaceous earth in sleeve.

TS 4610-221-12/3-15 ①

Figure 3-15. Filter Sleeve, Installation (Sheet 1 of 2)


DIATOMACEOUS EARTH
PERFORATED TUBE
STEP C
SLEEVE
PERFORATED TUBE
FILTER TUBE

STEP D

C. **Dusting perforated tube.**
D. **Placing tube in sleeve.**

TS 4610-221-12/3-15 ②

Figure 3-15. Filter Sleeve, Installation (Sheet 2 of 2)

(4) Install filter housing cover (2, fig. 2-30) on filter housing (17), position two halves of clamping ring (16) over filter housing cover and filter housing, and secure with two nuts and screws (15). Remove steel bands (5, fig. 3-16) that secure wood braces (2) between effluent launder (4) and mounting bracket (1). Raise and level effluent launder as necessary.

3-26. Waste Water Tank.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean waste water tank and grating with cleaning solvent (item 1, App. E).

b. Use a wire brush to remove scales.

c. Rinse thoroughly with clean water.

3-27. Chemical Solution Tank.

a. Clean inside and outside of chemical solution tank in a solution of strong soap and water. After cleaning, rinse thoroughly with clean water.

b. Inspect synthetic rubber lining of chemical solution tanks and tank covers for cracks, deterioration, and corrosion.

c. Inspect stud for damaged threads and distortion.

3-28. Diatomite Dilution Tank.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean metal parts of diatomite dilution tank with cleaning solvent (item 1, App. E).

b. Dry thoroughly.

3-29. Erdlator Tank Assembly.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

a. Clean metal parts of erdlator tank assembly with cleaning solvent (item 1, App. E).

b. Dry thoroughly.

3-30. Effluent Launder Leveling Rods.

Adjust effluent launder leveling rods until water is flowing uniformly throughout the entire circumference of the effluent launder.

3-31. Low Water Level Alarm Float.

a. General. The operation of low water level indicator light and buzzer indicates low water in wet well tank.

b. Adjustment. If low water level persists in wet well tank, decrease filter flow through flow control valve CV-45 (4, fig. 2-30) to 22 gpm; then in low water level still continues, turn three-way plug valve CV-46 (3) to R (recirculate) to maintain coating on filter elements.

3-32. Three-Way Plug Valve (Filtered Water).

a. General. The filtered water three-way plug valve is located in filtered water piping above flow control valve. It directs flow of filtered water to storage tanks outside of the van body or recirculates water to wet well tank for refiltering.

b. Cleaning and Inspection.

(1) Clean three-way plug valve with a solution of soap and warm water. Thoroughly rinse three-way plug valve to be sure that all soap film has been removed.

(2) Inspect three-way plug valve for cracks, breaks, evidence of water leaks, and damaged threads. Examine mechanical action of three-way plug valve. Report any damage to organizational maintenance.

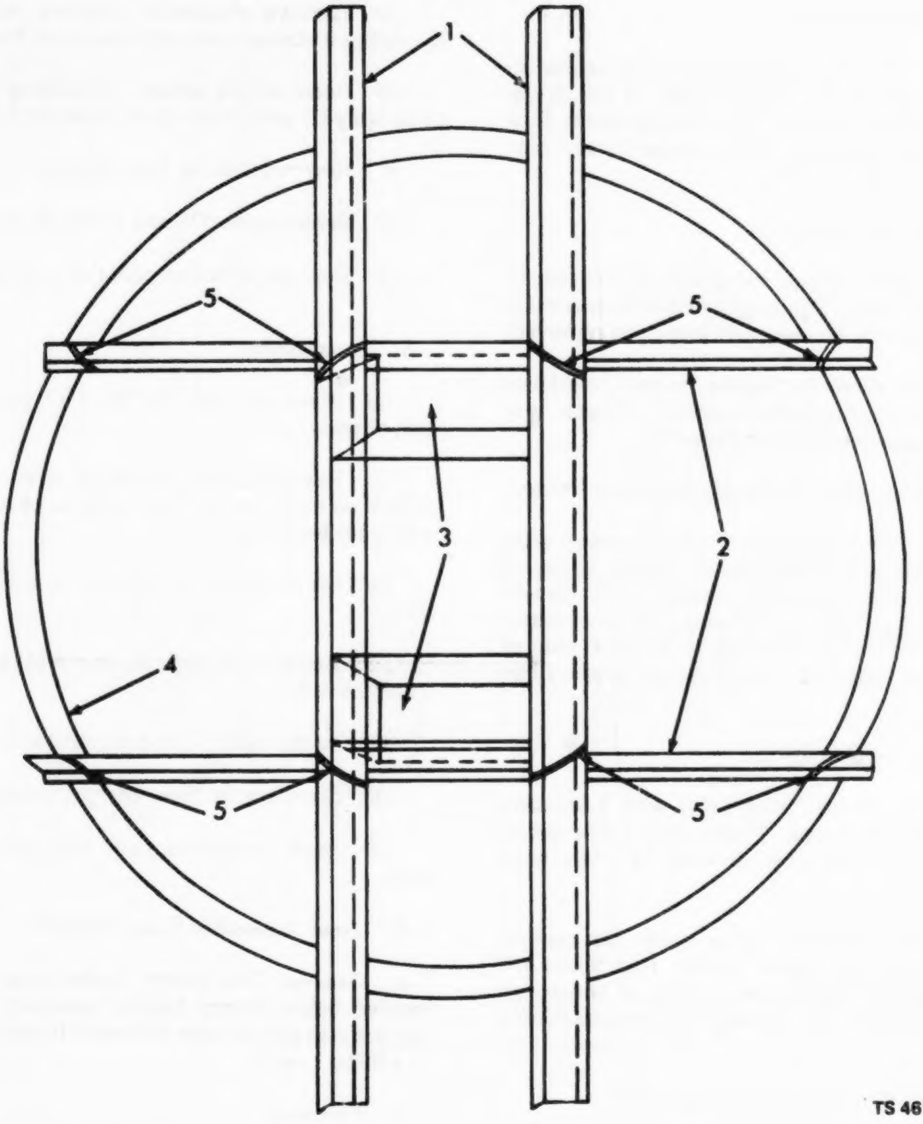

1
5
5
3
2
4
5
5
TS 4610-221-12/3-16

Figure 3-16. Effluent Launder, Anchoring

Legend for figure 3-16:

1. Mounting bracket
2. Brace, wood, 2 x 4 x 55 in. (2)
3. Influent launder
4. Effluent launder
5. Steel band (8)

3-33. Flow Control Valve.

a. *General.* The flow control valve is located in filtered water piping on effluent side of the diatomite filter. The flow control valve regulates the flow of water through diatomite filter assembly at a rate of 0 to 30 gallons per minute.

b. *Cleaning and Inspection.*

(1) Clean flow control valve with a solution of soap and warm water. Thoroughly rinse flow control valve to be sure that all soap film has been removed.

(2) Inspect valve for cracks, breaks, evidence of water leaks, and improper operation. Report any damage to organizational maintenance.

3-34. Three-Way Plug Valve (Coagulated Water).

a. *General.* The coagulated water three-way plug valve is located in the coagulated water piping to the left of the diatomite filter assembly. It directs flow of coagulated water to influent section of diatomite filter assembly for filtering or to wash ring of diatomite filter assembly for flushing lower filter shell.

b. *Cleaning and Inspection.*

(1) Clean three-way plug valve with a solution of soap and warm water. Thoroughly rinse three-way plug valve to be sure all soap film has been removed.

(2) Inspect three-way plug valve for cracks, breaks, evidence of water leaks, and damaged threads. Examine mechanical action of three-way plug valve. Report any damage to organizational maintenance.

3-35. Chlorine Residual Test Comparator.

a. *Service.* The chlorine residual test comparator should be checked and serviced as necessary by replacing the reagents to ensure full testing capability.

b. Component parts found defective should be replaced.

3-36. Prism Assembly, Front Cover, Body and Disk.

a. *Disassembly*

(1) Do not disassemble the comparator unless it is necessary to replace a broken or damaged part.

(2) Remove prismatic eyepiece (4, fig. 3-17) by sliding it straight out of the slots on front cover (3).

(3) Remove two screws (5) holding front cover (3) to body (1) and detach front cover (3) from body (1).

(4) Remove disk (2) from body (1).

(5) Remove cells (7), and bottle (6) from body (1).

(6) Replace defective parts as necessary.

b. *Reassembly.*

(1) Place one disk (2, fig. 3-17) so disk fits on hub of body (1).

(2) Position front cover (3) over disk (2) and attach to body (1), so little hole in cover shows the white circle on disk.

(3) Secure cover (3) to body (1) with two screws (5).

(4) Install prismatic eyepiece (4) in bracket on front cover (1).

(5) Insert cells (7) in compartments of body (1).

(6) Stow bottle (6) in compartment of body (1).

(7) Stow remaining cells and disk in carrying case.

3-37. Gear Assembly Speed Reducer.

a. *General.* The slurry feeder gear assembly is located below slurry feeder assembly and reduces revolutions per minute delivered by motor assembly at a 60 to 1 ratio.

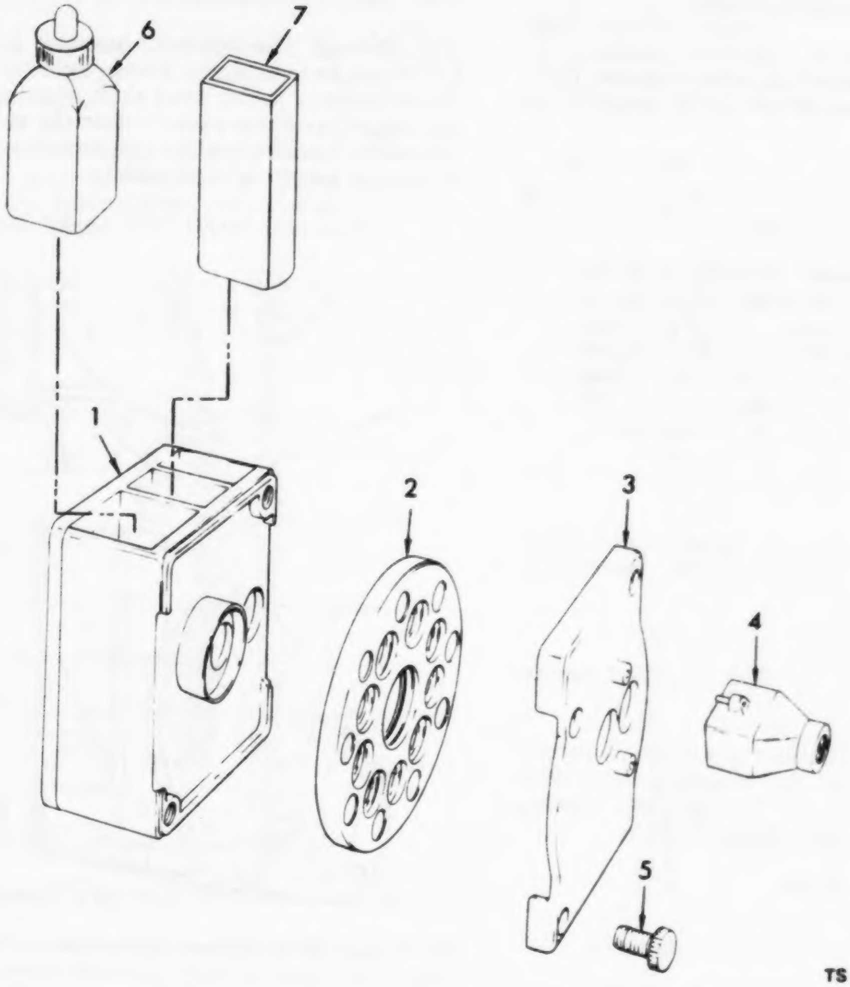
b. *Cleaning.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean gear assembly, pulley, and sprocket with cleaning solvent (item 1, App. E).

(2) Dry thoroughly.



TS 4610-221-12/3-17

Figure 3-17. Comparator (Typical), Exploded View

Legend for figure 3-17:

1. Comparator body
2. Disk (2)
3. Front cover
4. Prismatic eyepiece
5. Knurled screw, nylon, 5/16-18 x 7/16 in. (2)
6. ph reagent bottle
7. Cell (4)

3-38. Chain Tightener and Sprocket.

a. General. The chain tightener assembly is located near the center of the slurry feeder frame and allows the tension of the drive chain to be adjusted.

b. Cleaning.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Remove chain guard.

(2) Clean chain tightener assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

c. Adjustment.

(1) Loosen nut (7, fig. 3-18) to relieve tension on drive chain (1).

(2) Move chain tightener assembly (2) toward drive chain (1), meshing teeth of sprocket with drive chain, until all slack is out of drive chain. Tighten nut (7) to secure chain tightener assembly.

(3) Install chain guard.

3-39. Drive Chain.

a. General. The drive chain is located between slurry feeder gear assembly and slurry feeder assembly and transmits motion delivered to gear assembly to agitator within slurry feeder assembly.

b. Adjustment.

(1) Remove chain guard.

(2) Loosen nut (7, fig. 3-18) to relieve tension on drive chain (1).

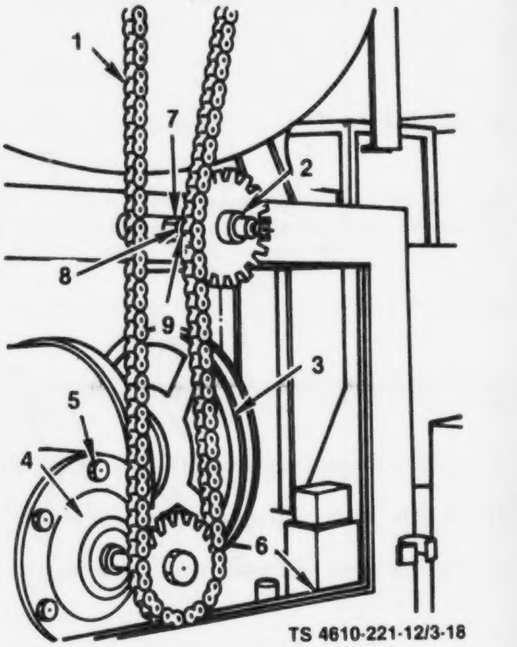
(3) Move chain tightener assembly (2) toward drive chain (1), meshing teeth of sprocket with drive chain until all slack is out of drive chain. Tighten nut (7) to secure chain tightener assembly.

(4) Install chain guard.

3-40. Slip Clutch and Sprocket.

a. General. The slip clutch assembly is located on the drive end of slurry feeder agitator shaft. It protects slurry feeder drive shaft when an overload or clogged condition exists within the slurry feeder assembly, by allowing the slip clutch assembly to disengage and drive to turn freely.

b. Adjustment (MET-PRO Model 1500-2600A).



TS 4610-221-12/3-18

Figure 3-18. Slurry Feeder Drive Chain and Tightener

Legend for figure 3-18:

1. Drive chain
2. Chain tightener assembly
3. V-belt
4. Slurry feeder gear assembly
5. Screw, cap, 3/8-16 x 1 1/4 in. (6)
6. Slurry feeder frame
7. Nut, hex, 1/2-13
8. Washer, flat, 0.521-0.541 I.D. x 1.062 O.D. (2)
9. Washer, lock, 1/2 in.

(1) Remove chain guard and chain.

(2) Pull loop end of lockwire (6, fig. 3-19) out of hole in adjusting nut (10) and place a block under it to keep it out.

(3) Turn adjusting nut clockwise to increase torque and counterclockwise to decrease torque. Gradually turn adjusting nut until a torque of 25 ft-lb (3.46 kg/m) is obtained.

(4) After clutch has been adjusted, make sure adjusting nut (10) is set so loop end of lockwire (6) extends through a hole and into a tooth space in drive hub (9).

(5) Install chain guard and chain.

NOTE

This figure is not applicable to ETC Model S1500.

c. *Adjustment* (ETC Model S1500).

(1) Remove chain guard and chain.

(2) Turn adjusting nut clockwise to increase torque and counterclockwise to decrease torque. Turn adjusting nut until a torque of 25 ft-lb (3.46 kg/m) is obtained.

(3) Install chain and chain guard.

3-41. Erdlator Agitator Drive Shaft Assembly.

a. *General.* The erdlator drive shaft and pulley transmits power delivered by motor assembly to gear assembly. The erdlator drive shaft rotates in lubricated bearings and is connected to gear reducer by a flexible coupling.

b. *Cleaning and Inspection.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean drive shaft, coupling, pillow block bearings, collars, pulleys, and mounting brackets with cleaning solvent (item 1, App. E). Dry thoroughly.

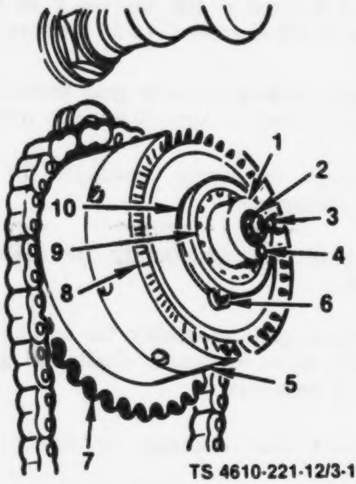
(2) Inspect mounting brackets for cracks, breaks, and distortion.

(3) Inspect bearing units for cracks, breaks, and evidence of burned or loose bearings.

(4) Inspect pulley for cracks, breaks, damaged screw threads, and nicks or burrs that would cause premature belt wear.

(5) Inspect flexible coupling for distorted or broken teeth and damaged screw threads.

(6) Report any damage to organizational maintenance.



TS 4610-221-12/3-19

Figure 3-19. Slip Clutch Assembly, Adjustments

Legend for figure 3-19:

1. Collar
2. Slurry feeder agitator shaft
3. Lubrication fitting
4. Setscrew, 5/16-18 x 1/4 in.
5. Clutch, housing
6. Lockwire
7. Sprocket
8. Slip clutch assembly
9. Drive hub
10. Adjusting nut

3-42. Gear Assembly Speed Reducer.

a. General. The erdlator agitator gear assembly is located above erdlator tank and drives erdlator agitator. The gear assembly is driven by the electric motor through agitator drive shaft at a ratio of 12.34 to 1.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean erdlator agitator gear assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect mounting brackets for cracks, breaks, and distortion.

(3) Inspect flexible couling for distorted or broken teeth.

(4) Inspect gear assembly for evidence of oil leaks, cracks, worn keyways, shaft end play, and noisy gears or bearings.

(5) Report any damage to direct support maintenance.

3-43. Filter Pump Assembly.

a. General. The filter pump assembly and motor assembly are enclosed in separate housings which are bolted together to form one integral unit. The centrifugal-type, rotary impeller pump and electric motor are located in the left front corner of van next to the diatomite filter assembly.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean the pump assembly with cleaning solvent (item 1, App. E). A wire brush may be used to aid removal of chemical scale.

(2) Inspect the pump casing for cracks, breaks, and damaged threads.

(3) Report any damaged to direct support maintenance.

3-44. Raw Water Pump Assembly.

a. General. Two portable electric motor driven water pumps are furnished with unit. The drive motors are bolted to frame base.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personal and property. Avoid repeated prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean pump and motor with cleaning solvent (item 1, App. E).

(2) Inspect motor for signs of overheating and a damaged electrical cable.

(3) Inspect pump for binding and a damaged or cracked housing.

(4) Report any damage to organizational maintenance.

3-45. Hose Fittings.

a. Cleaning and Inspection.

(1) Clean plastic hoses and fittings with clean cloth.

(2) Inspect hoses and fittings for incorrect mounting, looseness, cracks, and breaks.

b. Replacement.

(1) Loosen screws in tubing clamp and slide tubing from connector; then slide tubing clamp off tubing.

(2) Remove tubing holddown clamps and lift tubing from equipment.

NOTE

Save undamaged clamps for installation of new tubing.

(3) If new tubing is required, cut it to required length making sure walls are cut square.

(4) Blow through tubing to be sure opening is clear.

(5) Slide tubing clamps on tubing; then slide tubing on connectors and secure it with tubing clamps.

3-46. Fire Extinguisher.

a. Replace extinguisher after use.

b. Weigh extinguisher every three months and replace if gross weight has decreased four ounces (112 g) or more.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIAL

4-1. Unloading Equipment.

a. *Unloading Equipment if Van Body is Mounted on Truck Chassis.*

(1) Unloading by lifting kit. Refer to lifting kit use and installation instructions contained in lifting kit box to unload equipment (fig. 4-1).

CAUTION

Wire rope tends to stretch and have a smaller diameter under load. Do not attempt to lift water purification unit without first checking cables, making sure cable clips retaining nuts are torqued to 225 ft-lb (31.1 kg/m), and inspecting shackles and shackle pins to ensure that they are serviceable and securely fastened.

(2) Unloading by ramp.

(a) Prior to operating the truck, depreservation will be accomplished in accordance with instructions outlined on DA Form 2258 (Depreservation Guide for Vehicles and Equipment) which is attached to steering wheel.

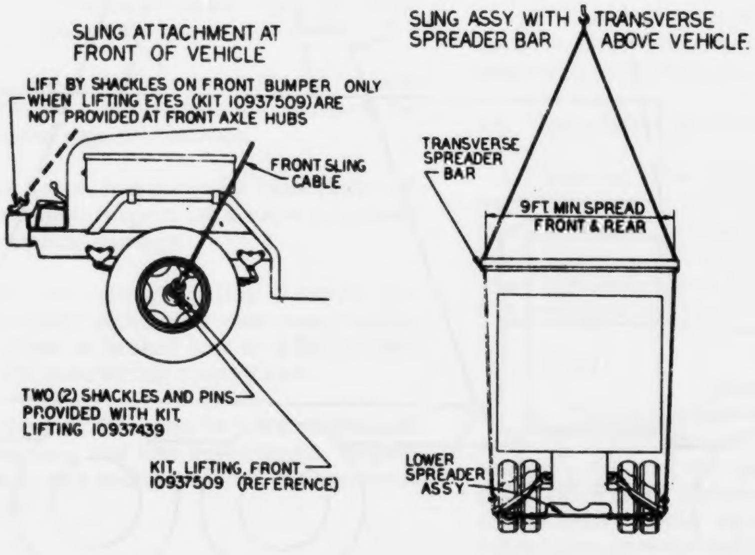
(b) Perform "before operation" preventive maintenance services outlined in the applicable technical manual.

(c) Refer to applicable technical manual for general lubrication instructions.

(d) Use low gear when driving down unloading ramp.

CAUTION

A ramp slope of more than 11 degrees will cause damaged to truck chassis when unloading.


SLING ATTACHMENT AT FRONT OF VEHICLE
LIFT BY SHACKLES ON FRONT BUMPER ONLY WHEN LIFTING EYES (KIT 10937509) ARE NOT PROVIDED AT FRONT AXLE HUBS
FRONT SLING CABLE
TWO (2) SHACKLES AND PINS PROVIDED WITH KIT, LIFTING 10937439
KIT, LIFTING, FRONT 10937509 (REFERENCE)
SLING ASSY WITH SPREADER BAR
TRANSVERSE ABOVE VEHICLE
TRANSVERSE SPREADER BAR
9FT MIN SPREAD FRONT & REAR
LOWER SPREADER ASSY

TS 4610-221-12/4-1

Figure 4-1. Truck Mounted Water Purification Unit Lifting Points

b. Unloading Van Body from Chassis by Lifting Device.

(1) Remove all blocking and tiedows that secure van to chassis (para 4-28).

(2) Attach four cables (1, fig. 4-2) to lifting brackets (3) located at base of van. Use spreader bars (2) to keep cables from pressing against van.

CAUTION

Do not attach cables to clamp mounted at top of the van.

(3) Lift van off chassis and lower to the ground carefully so as not to disturb or damage installed equipment.

Legend for figure 4-2:

1. Cables (4)
2. Spreader bars (2)
3. Lifting shackle brackets

4-2. Unpacking New Equipment.

a. General. Unpack equipment and separately packed components of water purification unit as close to water point as possible.

b. Depreservation. Prior to placing water purification unit in operation, depreservation will be accomplished in accordance with instructions outlined in DA Form 2258 which is attached to electrical control cabinent.

NOTE

If van body is chassis mounted, DA Form 2258 for the chassis will be attached to the steering wheel.

4-3. Inspecting and Servicing Equipment.

a. General. Before installing or setting up equipment, perform a complete inspection of all components of water purification unit. Pay particular attention to deterioration, wear, and misuse when inspecting used equipment.

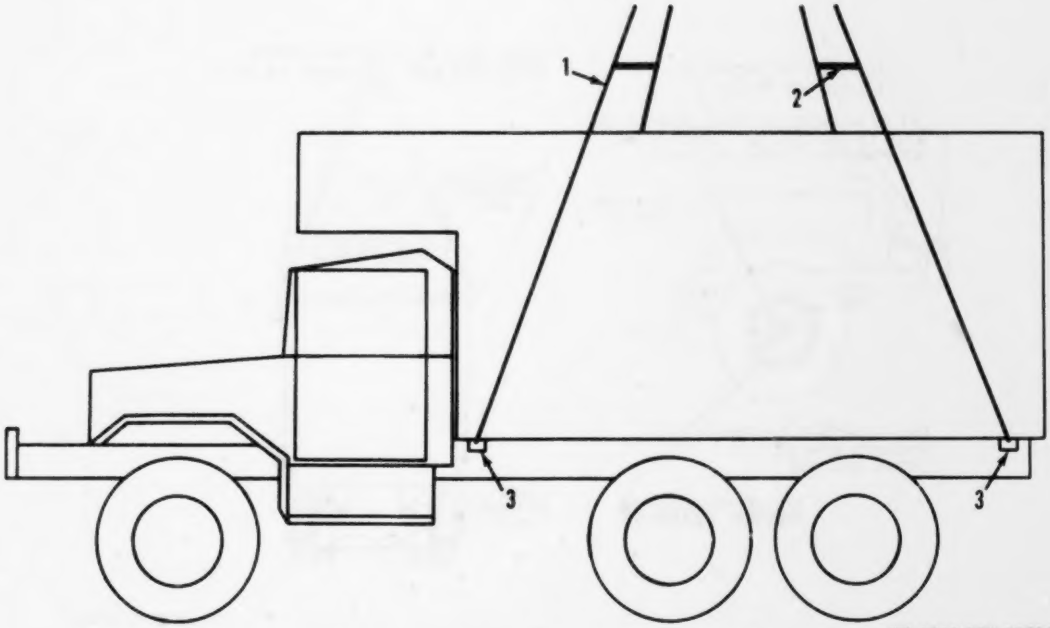


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Figure 4-2. Unloading Van Body from Chassis

b. Truck Chassis. Inspect truck chassis as described in applicable technical manual. Service radiator as described in applicable truck technical manual and table 4-1 during cold weather operation.

c. Water Purification Unit. Inspections performed on water purification unit refer to those components contained in the van body.

(1) Inspect erdlator tank, sludge concentrator tank, and wet well tank for cracked or broken welds and improper or damaged mounting.

(2) Inspect valves and piping for evidence of leaks, restricted operation, and apparent physical damage.

(3) Inspect hoses for loose connections, cracks, and breaks.

CAUTION

On unit serial numbers 787-815, the gear housing is filled with preservative lubricating oil and must be drained and filled to operating level with required lubricant prior to operating feeder. Gear housings on unit serial numbers 816-1083 are equipped with operating oil when shipped from point of manufacture.

(4) Inspect chemical solution feeder assembly for insufficient lubrication, apparent damage, and loose hose connection.

(5) Inspect air release valve for improper operation and apparent physical damage.

(6) Inspect diatomite filter assembly for cracked or broken welds, or a broken window. Inspect for loose mounting and pipe connections.

(7) Inspect heater fuel pump for loose electrical and pipe connections. Inspect for a loose mounting and apparent physical damage.

(8) Inspect van ceiling lighting fixtures, low water level indicator light, and clearance marker lights for a cracked or broken lens or a burned out lamp. Inspect for loose wiring connections.

(9) Inspect personnel heater for loose or damaged electrical wiring and fuel line connections. Inspect personnel heater and sediment bowl for apparent physical damage.

(10) Inspect influent and effluent pressure gages, raw water pressure gage, and rate of flow indicator for a cracked or broken lens, loose mounting and pipe connections, and other apparent physical damage.

(11) Inspect filter pump assembly and motor assembly for insecure mounting, a loose pipe and loose electrical wiring connections.

(12 Inspect erdlator, agitator and slurry feeder, gear assemblies, electric motor assemblies, and drive components for loose mounting and electrical connections. Inspect V-belts for cuts, frays, and improper adjustments. Inspect drive chains for apparent damage and improper adjustment.

(13) Open control cabinet and make a general visual and hand feel inspection for loose mounting and wiring connections. Be sure overload relays are in closed position.

(14) Visually inspect van body and doors for apparent physical damage, restricted or retarded operation of doors, broken windows, and loose mounting of van body to truck chassis.

d. Servicing New and Used Equipment.

(1) Refer to paragraph 3-4 and perform the operator's daily services.

(2) Lubricate as described in the current lubrication order.

(3) Lubricate and perform preventive maintenance services for truck chassis as described in applicable technical manual.

4-4. Installation of Separately Packed Components.

a. General. The water purification unit will be received mounted on truck chassis with heater fuel pump installed and electrical and fuel connections made. Twelve 3 1/2 inch hose clamps will be installed upon installation and setting up of water purification unit (para 4-5). Hoses will be positioned as follows:

b. Hoses.

(1) Uncoil tubing (7, fig. 2-23) attached to drain valve (2) of limestone compartment of slurry feeder assembly (3) and the other tubing (7) attached to drain valve (1) of diatomaceous earth compartment of the slurry feeder assembly. Place loose end of tubes in waste water tank.

Table 4-1. Freezing Points, Composition, and Specific Gravities of Military Antifreeze Materials

Lowest expected ambient temp. °F (temp. °C)	Pints (liters) of inhibited glycol per gal (3.8 liters) of coolant[1]	Compound, Antifreeze Arctic[2]	Ethylene glycol coolant solution specific gravity at 68°F (20°C)[3]
+20 (-6)	1 1/2	Issued full strength and ready mixed for 0 to -65° F temperatures for both initial installation and replacement of losses. DO NOT DILUTE WITH WATER OR ANY OTHER SUBSTANCE	1.022
+10 (-12)	2		1.036
0 (-18)	2 3/4		1.047
-10 (-23)	3 1/4		1.055
-20 (-24)	3 1/2		1.062
-30 (-34)	4		1.067
-40 (-40)	4 1/4		1.073
-50 (-46)	Arctic Antifreeze preferred		
-60 (-51)			
-75 (-59)			

[1] Maximum protection is obtained at 60 percent by volume (4.8 pints of ethylene glycol per gallon of solution).

[2] Military Specifications MIL-C-11755 Arctic type, nonvolatile antifreeze compound is intended for use in the cooling system of liquid-cooled internal combustion engines. It is used for protection against freezing primarily in Arctic regions where the ambient temperature remains for extended periods close to -40°F (-40°C) or drops below, to as low as -90°F (-68°C).

[3] Use an accurate hydrometer. To test hydrometer, use 1 part ethylene glycol antifreeze to 2 parts water. This should produce a hydrometer reading of 0°F (-18°C).

NOTE: Fasten a tag near the radiator filler cap indicating the type antifreeze.

(2) Uncoil hose (5) attached to control valves (4) located on the front of erdlator tank (6). Place loose end of hose in the waste water tank.

(3) Uncoil hose (17, fig. 2-6) which is connected to control valve (1) located in filter water piping next to slurry feeder assembly (4). Place loose end of hose in waste water tank.

4-5. Installation or Setting Up Instructions.

a. Position truck mounted water purification unit in its selected location at water point in a similar location as illustrated in figure 2-25.

b. Install blocks or timbers under wheels of truck chassis to provide initial leveling and prevent settling.

c. Set truck chassis handbrake.

d. Place two chock blocks behind and in front of the rear dual wheels.

e. Loosen nuts (7, fig. 4-3) and lift locking bar (6) that secures the four leveling jack assemblies (1) inside van body. Remove leveling jack assemblies from inside van body.

f. Install leveling assemblies (3, fig. 3-4) in recesses provided under the four corners of van body (1).

g. Remove pin (4) and adjust the length of the leveling jack assemblies to appropriate height between van body and ground. Provide timbers or blocks for jack footing on the ground.

Legend for figure 4-3:

1. Leveling jack assembly (4)
2. Van body
3. Top rack assembly
4. Bottom rack assembly
5. Chain
6. Locking bar (2)
7. Nut, plain, wing, 3/8-16 (4)
8. Stud 3/8 x 16, 1 1/2 in.

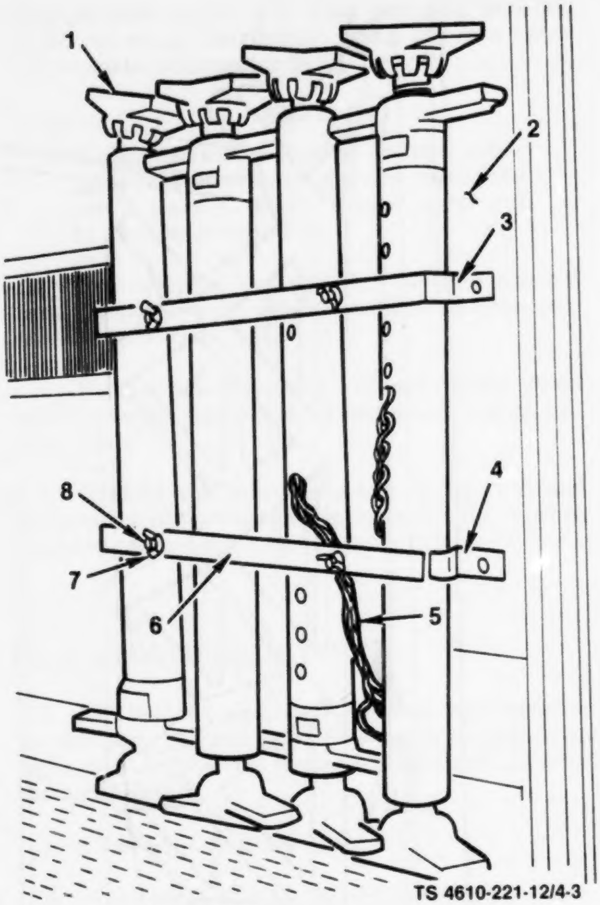

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Figure 4-3. Leveling Jack Assemblies

h. Turn hand nut (2) clockwise to raise jack. Adjust four leveling jack assemblies as required until the three levels (5, fig. 3-4), located on the two sides and rear of van body (1), indicate that van body is level.

i. If weather permits, open side doors (2, fig. 1-3).

NOTE

Do not use side doors of the van body as an operating platform without first placing blocking under them for additional support.

j. Loosen wingnut (1, fig. 4-4) and swing clamp (2) away from ladder assembly (3).

k. Lift ladder assembly (3) from right side door (4).

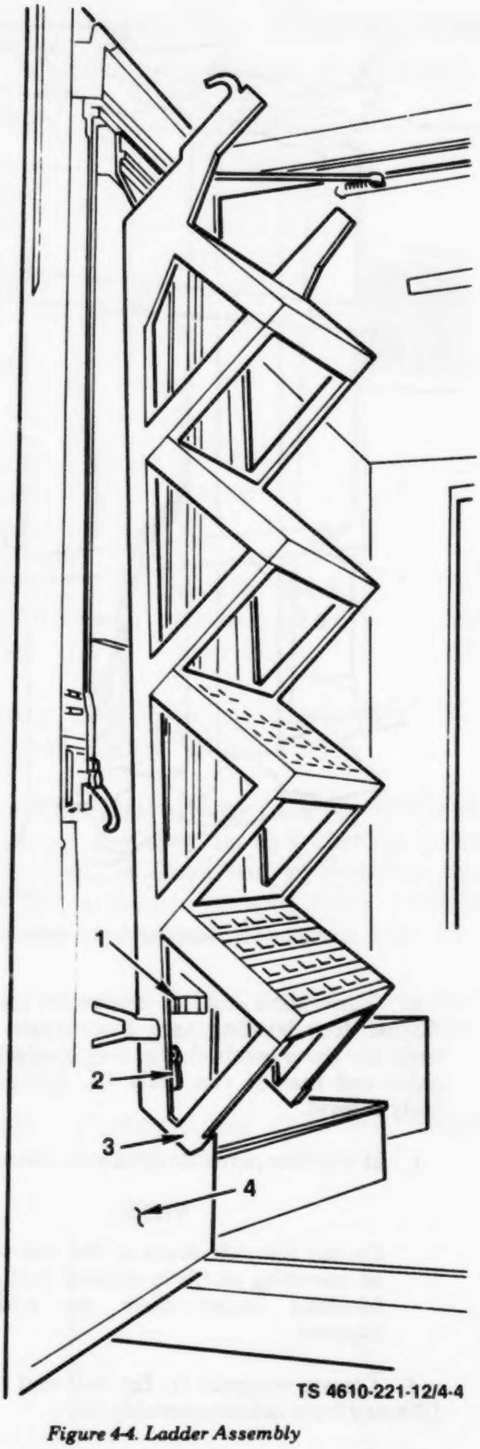

Figure 4-4. Ladder Assembly

Legend for figure 4-4:

1. Wingnut (spec)
2. Clamp
3. Ladder assembly
4. Right side door

l. Install ladder in recesses provided in van body (1, fig. 1-2) below right side door (3).

m. Remove ladder assembly (7) and install it in the recesses provided in van body floor inside rear door (8).

n. Ground truck chassis by driving metal ground rod 30 inches (76 cm) into earth. Connect electrical cable of ground rod to ground stud (12, fig. 1-3) located on left front corner of van body.

WARNING

Static electricity and current leakage from electrical equipment buildup in truck and van body and can cause injury or death to personnel by electric shock unless proper grounding is accomplished.

o. Remove cable outlet cap (4, fig. 1-2) and lead power cable (32, fig. 2-25) from generator set (37) or external power source through cable outlet (20).

NOTE

An external power source other than generator set may be available and can be utilized. The utilization of external power source must be accomplished by a qualified electrician.

p. Open door of control cabinet (7, fig. 2-14) and insert power cable (6) through bottom of control cabinet.

q. Connect the four wires of power cable (6) to terminals (2, 3, 4, and 5). The wires of the power cable must be connected to the same terminals on terminal board as they are connected to on generator set.

NOTE

If all electric motors run in reverse, interchange any two wires except neutral wire at terminal board.

r. Route electrical lead (21, fig. 2-25) of raw water pump (31) through cable outlet (20).

s. Plug electrical lead of raw water pump into twist-lock receptacle connector (1, fig. 3-8) located below the chemical solution feeder assembly (2).

t. When suction lift for raw water pump exceeds 20 feet (6.1 m), connect both electrical driven raw water pumps (31, fig. 2-25) in series.

u. Route electrical lead of second raw water pump through cable outlet (20) and connect it to electrical receptacle (3, fig. 3-8).

v. Remove hose cap (5, fig. 1-2) from raw water inlet port and connect suction hose (22, fig. 2-25) to van body (16).

w. In only one raw water pump (31) is used on the suction side of van, remove cable outlet cap (11, fig. 1-3) and route electrical lead (48, fig. 2-25) through cable outlet (17). Plug electrical lead (48) of filtered water distribution pump (38) into twist-lock receptacle connector (3, fig. 3-8).

NOTE

If electrical driven filtered and raw water pumps are used on the suction side of the van, a gasoline engine driven pump will be used for distribution.

x. Remove hose cap (10, fig. 1-3) and connect storage tank hose (15, fig. 2-25) to filtered water outlet (18) on van body (16).

y. Remove hose cap (9, fig. 1-3) and connect waste water hose (49, fig. 2-25) to waste outlet (19) on van body (16).

z. Remove the other hose cap (6, fig. 1-2) and connect the other waste water hose (50, fig. 2-25) to waste water outlet (34) on van body (16).

Section II. MOVEMENT TO A NEW WORKSITE

4-6. Dismantling for Movement.

a. Stop operation of water purification unit. Lower effluent launder and install wood braces (2, fig. 3-16) between mounting bracket (1) and effluent launder (4). Secure with steel bands (5).

b. Disconnect two waste water hoses (49 and 50, fig. 2-25), storage tank hose (15), and suction hose (22) from van body (16). Install two hose caps (5 and 6, fig. 1-2) and two caps (9 and 10, fig. 1-3).

c. Disconnect electrical lead (21, fig. 2-27) and electrical lead (48) from twist-lock receptacle connectors (1 and 3, fig. 3-18) below chemical solution feeder assembly (2). Remove electrical leads from van body and install cable outlet cap (11, fig. 1-3).

d. Disconnect power cable from source.

e. Pull power cable into van, coil and secure at bottom of control panel.

f. Install cable outlet cap (4, fig. 1-2).

g. Disconnect electrical cable of ground rod and cable (35, fig. 2-25) from ground stud (12, fig. 1-3) and remove ground rod from the ground.

h. Remove rear entrance ladder assembly (7, fig. 1-2) and stow it inside van body.

i. Lift ladder assembly (2, fig. 1-2) from recesses in van body (1) and stow side entrance ladder on right side door (4, fig. 4-4). Position clamp (2) over ladder assembly.

j. Close left side doors (2, fig. 1-3).

k. Turn hand nuts (2, fig. 3-4) counterclockwise, lowering leveling jack assemblies (3).

l. Remove four leveling jack assemblies (3) from corners of van body (1). Stow leveling jack assemblies inside van body, position locking bars (6, fig. 4-3) over leveling jacks and secure locking bars with four nuts (7).

m. Remove chocks from behind and in front of rear dual wheels.

n. Perform operator's daily services (para 3-4).

o. The water purification unit is now ready for movement to a new worksite.

4-7. Reinstallation After Movement.

On arrival at worksite, locate and set up water purification unit in a manner similar to that described in paragraph 4-5.

Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-8. Special Tools and Equipment.

No special tools or equipment are required to perform organizational maintenance on the water purification unit.

4-9. Repair Parts.

Repair parts are listed and illustrated in repair parts and special tools list covering organizational maintenance for this equipment, TM 5-4610-221-20P. Repair parts for heater are listed in TM 5-4520-227-14.

4-10. Fabricated Tools and Equipment.

No specially designed tools or equipment are required to perform maintenance on water purification unit.

Section IV. LUBRICATION INSTRUCTIONS

4-11. General.

This section contains lubrication instructions which are supplemental to, and are not specifically covered in lubrication order LO 5-4610-221-12. For current and approved lubrication order, refer to DA PAM 310-4.

4-12. Detailed Lubrication Information.

a. Care of Lubricants and Lubricating Equipment. Keep all lubricants in closed containers and store them in a clean, dry place away from heat. Do not allow dirt, water, or foreign matter to come in contact with lubricants at any time. Keep all lubricating equipment clean and ready for use.

b. Points of Application. The points of lubricant application for the water purification unit are identified in the lubrication order. Apply the lubricants as indicated in the lubrication order. For detailed lubrication of truck chassis, refer to applicable technical manual.

c. Cleaning.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Before lubricating equipment, wipe all lubrication points clean with cleaning solvent (item 1, App. E).

(2) Wipe up spilled lubricants and clean around lubrication points after servicing.

d. Three-Way Plug Valves. Inspect the operation of three way plug valve in the coagulated water piping and three-way plug valve in filtered water piping to make sure there is sufficient pressure on lubricant stick to ensure lubrication of the valve stem.

NOTE

For ETC Model S1500, paragraph d. above does not apply.

Section V. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-13. General.

To ensure that water purification unit is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in table 4-2. Item numbers indicate sequence of minimum inspection requirements. Defects discovered during operation of unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded together with corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at earliest possible opportunity.

NOTE

For specific preventive maintenance of carrier, refer to applicable technical manual.

4-14. Quarterly Preventive Maintenance Services.

Refer to table 4-2 for organizational quarterly preventive maintenance services.

Section. VI. TROUBLESHOOTING

4-15. General.

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in water purification unit. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. The table lists common malfunctions which you may find during operation or maintenance of the water purification unit or its components. You should perform the tests/inspections and corrective actions in the order listed.

4-16. Organizational Maintenance Troubleshooting.

For organizational maintenance troubleshooting, refer to table 4-3.

NOTE

Before you use this table, be sure you have performed all normal operational checks. If you have a malfunction which is not listed in this table, notify the next higher level of maintenance.

Section VII. RADIO INTERFERENCE SUPPRESSION

4-17. Definition.

a. Interference. The term "interference", as used herein, applies to electrical disturbances in radio frequency range which are generated by personnel heater within water purification unit and which may interfere with proper operation of radio receivers or other electronic equipment or enable the enemy to locate equipment.

b. Interference Suppression. The term "interference suppression", as used herein, applies to methods used to eliminate or effectively reduce radio interference generated by personnel heater. Suppression is attained by providing a low-resistance path to ground for stray currents. Methods used include shielding ignition and high-frequency wires, grounding frame with bonding straps, and using capacitors and resistors.

Table 4-2. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

INTERVAL W-WEEKLY (40 HOURS) M-MONTHLY (100 HOURS) S-SEMIANNUAL (500 HOURS) H-HOURS (AS INDICATED)

ITEM NO.	W	M	S	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY/ AVAILABLE IF:
1				Carrier Vehicle	Perform PMCS as scheduled in applicable vehicle TM. Lubricate according to current LO.	
2	●			Purification Unit	Inspect entire unit for cracked or broken welds, loose or missing parts and hardware, and damaged or excessively worn components, lines, and hoses.	
3		●		Gear Case Oil Levels	a. Check sight glass on agitator and slurry speed reducer for proper oil level. Oil level should be about midway in sight glass. Add oil if required.	
			●		b. Check oil level in solution feeder assembly gear case by removing fill and level plug and observing oil level. Proper level is approximately 1/2 inch below bottom of filler plug threads. (Refer to Lubrication order pages 3-2 and 3-3 for location of sight glasses and filler plug, and for oil specification).	
4			●	Personnel Heater	Drain sediment and water from fuel filter and clean filter element.	
5			●	Electrical Power Cables	Check power cables and receptacles for damage, and wear or deterioration of cables, cable insulation, and receptacles.	

All data on pages 4-11 through 4-15 deleted.

All data on pages 4-11 through 4-15 deleted.

Table 4-3. Organizational Troubleshooting

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. WATER PURIFICATION UNIT RECEIVES INSUFFICIENT OR NO RAW WATER

Step 1. Check if raw water pump is rotating in wrong direction.

Interchange any two or three electrical leads to the filter pump motor.

Step 2. Check if twist lock receptacle connector for raw water pump is defective.

Replace the twist lock receptacle connector (para 4-66).

Step 3. Check if START and STOP pushbutton or contact block for raw water pump is defective.

Replace the START and STOP pushbutton or contact block (para 4-60).

Step 4. Check for defective raw water pump.

Replace the raw water pump (para 4-105).

2. RATE OF FLOW INDICATOR SHOWS INCORRECT READING

Check if rate of flow indicator is defective.

Replace the rate of flow indicator (para 4-74).

3. RAW WATER PRESSURE GAGE SHOWS INCORRECT READING

Step 1. Check for clogged or defective aspirators.

Clean or replace aspirators (para 4-88).

Step 2. Check if raw water pressure gage is defective.

Replace the raw water pressure gage (para 4-70).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

4. CHEMICAL SOLUTION FEEDING ASSEMBLY SUPPLYING INSUFFICIENT OR NO SOLUTION

Step 1. Check if START and STOP pushbutton or contact block are defective.

Replace the START and STOP pushbutton or contact block (para 4-60).

Step 2. Check for defective chemical solution feeder assembly.

Replace the chemical solution feeder assembly (para 4-78).

5. SLURRY FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SLURRY

Step 1. Check if limestone slurry ejector is clogged or defective.

Clean or replace the limestone slurry ejector (para 4-92).

Step 2. Check for burned out fuse or defective fuse holder.

Replace fuse or fuse holder (para 4-67).

Step 3. Check for defective drive chain and chain tightener assembly.

Replace the drive chain and chain tightener assembly (para 4-101 and 4-102).

Step 4. Check for defective diatomite dilution tank.

Repair the diatomite dilution tank (para 4-84).

Step 5. Check for defective slip clutch assembly.

Replace slip clutch assembly (para 4-103).

Step 6. Check for defective twist lock receptacle connector.

Replace twist lock receptacle connector (para 4-66).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

5. SLURRY FEEDER ASSEMBLY SUPPLYING INSUFFICIENT OR NO SLURRY - Cont

Step 3. Check for defective drive chain and chain tightener assembly.

Replace the drive chain and chain tightener assembly (para 4-101 and 4-102).

Step 4. Check for defective diatomite dilution tank.

Repair the diatomite dilution tank (para 4-84).

Step 5. Check for defective slip clutch assembly.

Replace slip clutch assembly (para 4-103).

Step 6. Check for defective twist lock receptacle connector.

Replace twist lock receptacle connector (para 4-66).

Step 7. Check for defective START and STOP pushbutton or contact block.

Replace the START and STOP pushbutton or contact block (para 4-60).

Step 8. Check for defective slurry feeder gear assembly.

Replace the slurry feeder gear assembly (para 4-99).

Step 9. Check for defective slurry feeder V-belt.

Replace V-belt (para 4-50).

Step 10. Check for defective slurry feeder motor assembly.

Replace motor assembly (para 4-48).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

6. LOW WATER LEVEL INDICATOR LIGHT OR WARNING BUZZER INOPERATIVE

Step 1. Check for defective indicator light and buzzer toggle switch.

Replace the indicator light and buzzer toggle switch (para 4-59).

Step 2. Check for defective low water level sensitive switch.

Replace low water level sensitive switch (para 4-58).

Step 3. Check for defective warning buzzer.

Replace warning buzzer (para 4-62).

7. ERDLATOR TANK FAILS TO DELIVER DESIRED QUANTITY OR QUALITY OF WATER

Check for defective effluent launder rubber boot.

Replace effluent launder rubber boot (para 4-79).

8. FILTER PUMP ASSEMBLY FAILS TO PUMP WATER

Step 1. Check for defective erdlator agitator motor.

Replace the motor assembly (para 4-47).

Step 2. Check for defective twist lock receptacle connector.

Replace twist lock receptacle connector (para 4-66).

Step 3. Check for defective START and STOP pushbutton or contact blocks.

Replace START and STOP pushbutton or contact blocks (para 4-60).

Step 4. Check for defective erdlator agitator drive shaft or bearing units.

Repair or replace erdlator agitator drive shaft or bearing units (para 4-104).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

8. FILTER PUMP ASSEMBLY FAILS TO PUMP WATER - Cont

Step 5. Check for defective erdlator agitator flexible coupling.

Replace flexible coupling (para 4-104).

Step 6. Check for defective agitator shaft bearing.

Replace agitator shaft bearing (para 4-104).

9. FILTER ELEMENTS WILL NOT TAKE PRECOAT

Check for defective air release valve.

Replace air release valve (para 4-97).

10. EFFLUENT PRESSURE GAGE READING DROPS FASTER THAN USUAL

Check for defective effluent pressure gage.

Replace effluent pressure gage (para 4-71).

11. INFLUENT PRESSURE GAGE READING IS LOWER THAN USUAL

Check for defective influent pressure gage.

Replace influent pressure gage (para 4-71).

12. DIATOMITE FILTER RUNS ARE TOO SHORT OR TOO LONG

Step 1. Check for defective flow control valve.

Replace flow control valve (para 4-95).

Step 2. Check for defective valves and piping.

Repair or replace valves or piping (para 4-93).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

13. DIATOMITE FILTER ASSEMBLY WILL NOT DELIVER WATER

Step 1. Check for defective air release valve.

Replace air release valve (para 4-97).

Step 2. Check for defective valves and piping.

Replace valves or piping (para 4-93).

Step 3. Check for defective diatomite filter assembly.

Replace diatomite filter assembly (para 4-80).

14. WASTE WATER WILL NOT DRAIN OUT OF VAN.

Step 1. Check for defective waste water tank.

Replace waste water tank (para 4-82).

Step 2. Check for defective valves, piping and hoses.

Replace valves, piping and hoses (para 4-93).

15. CLEARANCE MARKER LIGHTS INOPERATIVE.

Check for defective clearance marker lights.

Repair or replace clearance marker lights (para 4-22).

16. VAN CEILING LIGHTING FIXTURE INOPERATIVE

Step 1. Check for improperly connected outside source power cable.

Connect the power cable to the proper terminals inside the control cabinet.

Step 2. Check for defective circuit breaker.

Replace circuit breaker (para 4-54).

Table 4-3. Organizational Troubleshooting - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

16. VAN CEILING LIGHTING FIXTURE INOPERATIVE - Cont

Step 3. Check for defective van ceiling light toggle switch.

Replace van ceiling light toggle switch (para 4-57).

Step 4. Check for defective blackout switch.

Replace blackout switch (para 4-55).

Step 5. Check for defective van ceiling lighting fixture.

Repair or replace van ceiling lighting fixture (para 4-23).

17. VAN BODY LEAKS DURING RAINY OR BLACKOUT OPERATION

Step 1. Check for defective stationary windows.

Repair or replace stationary windows (para 4-34).

Step 2. Check for defective ventilating window.

Repair or replace ventilating window (para 4-35).

Step 3. Check for defective right and rear door handles and latches.

Replace the right and rear door handles and latches (para 4-30).

Step 4. Check if left door counterbalance is out if adjustment or damaged.

Adjust the left door counterbalance or repair, if defective (para 4-38).

Step 5. Check for defective roof hatch.

Repair the roof hatch (para 4-44).

4-18. Interference Suppression Components.

a. *Primary Suppression Components.* The primary suppression components are those whose primary function is to suppress radio interference. These components are described and located in figure 4-5.

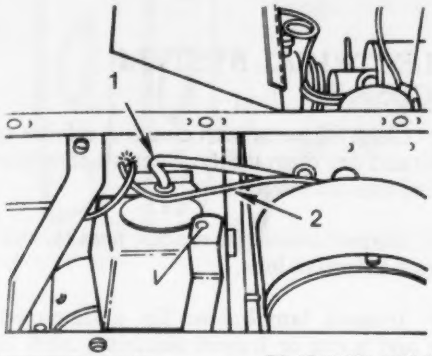

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Figure 4-5. Radio Interference Suppression Components

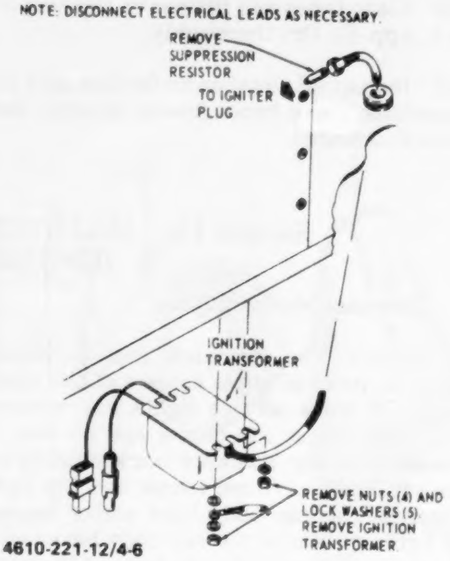
Legend for figure 4-5:

1. Ignition transformer shielded lead
2. Ground lead (2)

b. *Seconcary Suppression Components.* These components have radio interference suppression functions which are incidental and/or secondary to their primary function.

4-19. Replacement of Suppression Components.

Refer to figure 4-6 and replace ignition transformer shielded lead resistor.


NOTE: DISCONNECT ELECTRICAL LEADS AS NECESSARY.
REMOVE SUPPRESSION RESISTOR
TO IGNITER PLUG
IGNITION TRANSFORMER
REMOVE NUTS (4) AND LOCK WASHERS (5). REMOVE IGNITION TRANSFORMER

TS 4610-221-12/4-6

Figure 4-6. Ignition Transformer and Suppression Resistor, Removal and Installation

4-20. Testing of Radio Interference Suppression Components. Test ignition transformer shielded lead resistor for an electrical short or an electrical open with a multimeter. Replace a defective ignition transformer shielded lead resistor. If test equipment is not available and interference is indicated, isolate cause of interference by trial and error method.

Section VIII. MAINTENANCE OF FULE SYSTEM

NOTE

In following maintenance sections, all components, piping, etc. which come in contact with raw, coagulated, or filtered water and are cleaned with drycleaning solvent should be thoroughly rinsed with water to remove any solvent residue. It is possible that solvent residue left on components could cause a bad taste or odor.

4-21. Fuel Lines and Fittings.

a. *Removal.* Remove fuel lines from the fuel system as necessary for cleaning, inspection, or replacement.

b. *Cleaning and Inspection.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean tubes and fittings in cleaning solvent (item 1, App. E). Dry thoroughly.

(2) Inspect all metal parts for damaged threads, obstructions, kinks, bends, cracks or other damage. Replace if damaged.

c. *Installation.* Install any fuel lines that were removed for cleaning and inspection.

NOTE

Replacement fuel lines are fabricated locally from bulk stock.

Section IX. MAINTENANCE OF ELECTRICAL SYSTEM (ENGINE AND VEHICULAR)

4-22. Clearance Marker Lights.

a. *General.* The clearance marker lights are mounted in pairs at upper corners of the van body. A group of three service lights are mounted on front of the van at top center and on rear at the top center. The top clearance marker lights on rear of the van body have red lenses and top lights on the front of the van body have amber lenses. The lower lights on rear of the van body have red blackout lenses and lower lights on front of the van body have white blackout lenses. The service lights on front are amber; lights on rear are red. All clearance lights are 24 volts and are controlled from truck cab.

b. *Lamp Replacement.*

(1) Remove two screws (1, fig. 4-7) and lift door (2) with lens (3) off lampholder base (10).

(2) Push lamp (4) in and turn counterclockwise, removing it from grommet and wire assembly (8).

(3) Install lamp (4) in lampholder (8) by pushing lamp in and turning clockwise to secure in position.

(4) Install door (2) with lens (3) on lampholder base (10) and secure with two screws (1).

(5) Replace other lamps in a similar manner.

(6) Remove and disassembly the seven other clearance marker lights in a similar manner.

d. *Cleaning and Inspection.*

WARNING

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(1) Clean all parts with cleaning solvent (item 1, App. E) and dry thoroughly. Remove corrosion from electrical contact surfaces.

(2) Inspect lenses for cracks, breaks, and chips. Replace a defective lens.

(3) Inspect lampholder for a damaged lamp socket and a cut or frayed electrical lead. Replace lampholder if defective.

(4) Inspect lampholder base and door for a cracked or broken condition. Replace if defective.

e. *Reassembly and Installation.*

(1) Position preformed felt (11, fig. 4-7) lampholder base (10) on van body and secure with four screws (9).

(2) Connect electrical lead of lampholder (8) to van body wiring. Position lampholder on lampholder base (10). Secure strap and lampholder to lampholder base with washer (7) and screw (6).

(3) Position lenses (3) in door (2) and secure with two spring nuts (5).

(4) Install lamp as described in paragraph b. above.

(5) Reassemble and install the other clearance marker lights in a similar manner.

4-23. Van Ceiling Lighting Fixture.

a. *General.* The three flush-mounted, 110 volt van ceiling lighting fixtures have frosted glass panels. The door of each lighting fixture is of the pulldown type and is tension spring retained.

b. *Lamp Replacement.*

(1) Pull door frame (1, fig. 4-8) away from ceiling.

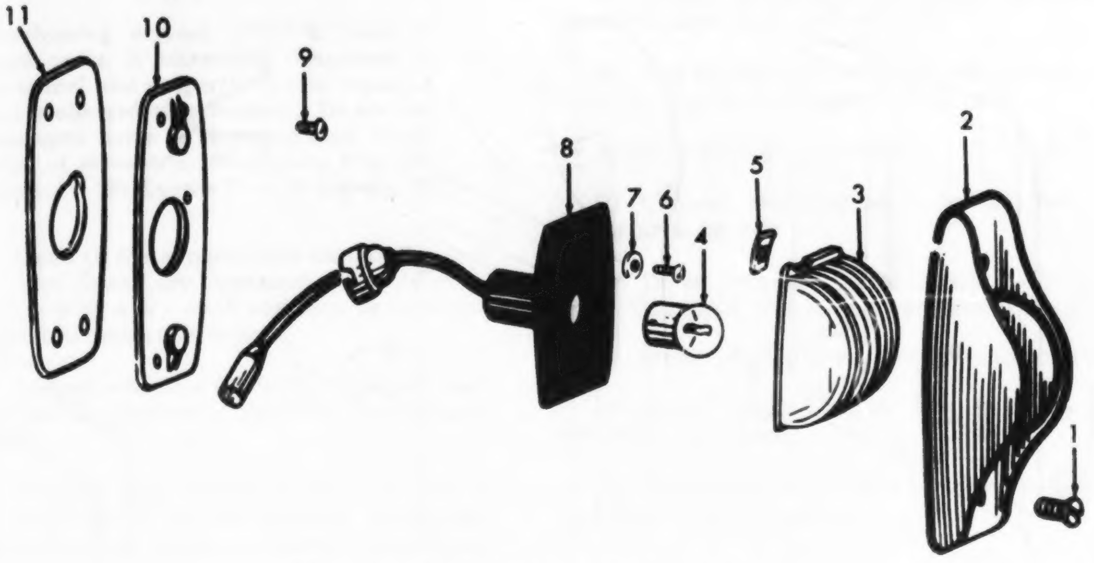


Figure 4-7. Clearance Marker Lights, Exploded View

TS 4610-221-12/4-7

Legend for figure 4-7:

1. Screw, machine (2)
2. Door
3. Lens
4. Lamp
5. Nut, sheet, spring
6. Screw, machine
7. Washer, flat
8. Lampholder
9. Screw, self-tapping
10. Base
11. Pad, insulator

(2) Compress two spring (2) together and remove door frame (1) from housing (12).

(3) Remove lamp (5) from lamp receptacle (6).

(4) Install lamp (5) in lamp receptacle.

(5) Position door frame (1) on ceiling, compress springs (2), and engage springs in the frame.

(6) Push door frame up flush against ceiling.

(7) Replace the two other lamps in a similar manner.

c. *Removal and Disassembly.*

(1) Remove lamp as described in paragraph b. above.

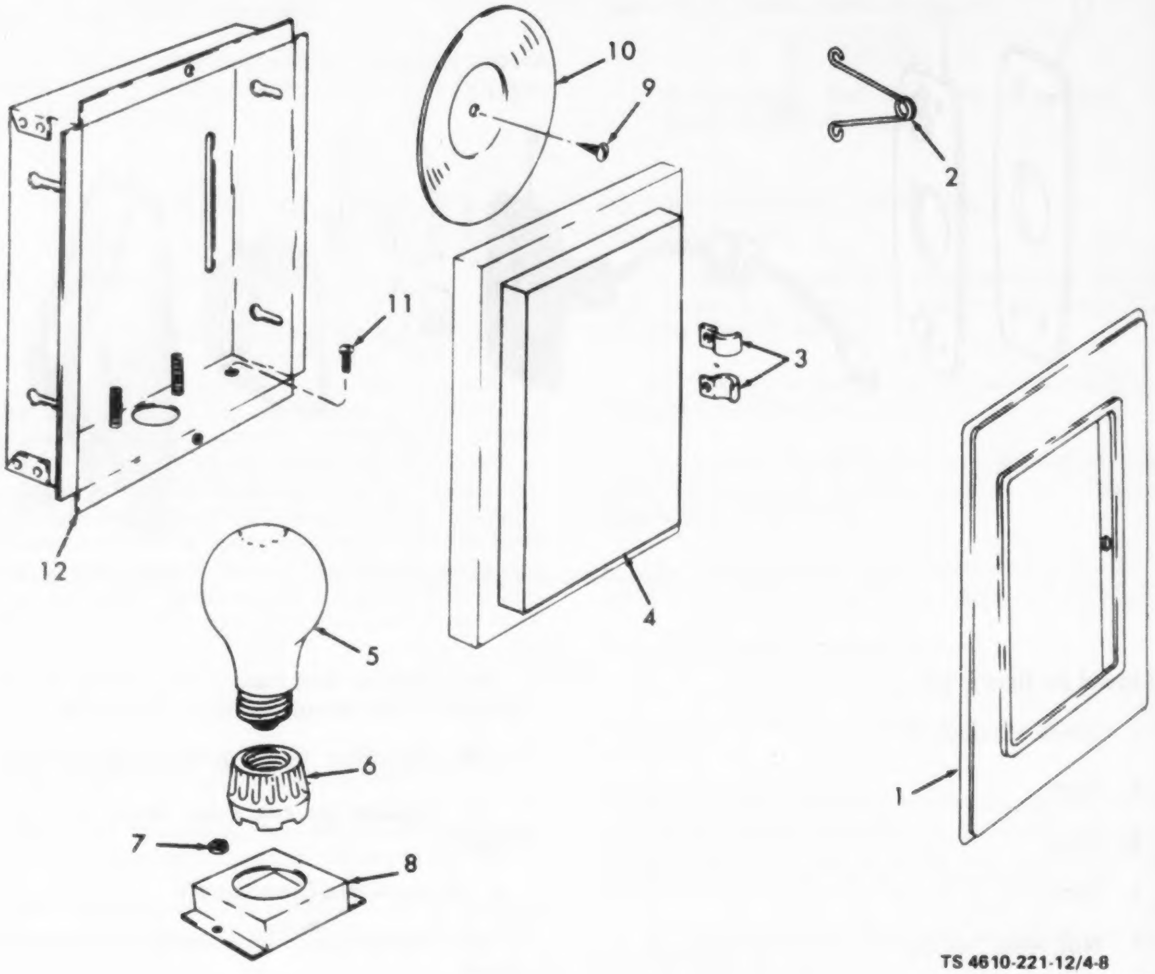
(2) Remove housing from van ceiling by removing screws (11, fig. 4-8).

(3) Remove receptacle from housing by removing locknut (7) at base of lamp.

(4) Tag and remove electrical leads from base of receptacle.

(5) Remove and disassemble two remaining van ceiling lighting fixtures in a similar manner.

d. *Cleaning and Inspection.*



TS 4610-221-12/4-8

Figure 4-8. Van Ceiling Light Fixture, Exploded Views

Legend for figure 4-8:

1. Frame
2. Spring
3. Clip, brass
4. Glass panel
5. Lamp, incandescent
6. Socket, lamp
7. Nut, hex, socket
8. Housing, socket
9. Screw, self-tapping
10. Reflector, light
11. Screw, self-tapping
12. Housing

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all metal parts with cleaning solvent (item 1, App. E) and dry thoroughly.Wipe electrical parts clean with a dry cloth and remove corrosion from electrical contact surfaces.

(2) Inspect reflectors for dents, scratches, rust, and tarnishing. Replace a defective or damaged reflector.

(3) Inspect lamp receptacle for a cracked or broken body, cut or frayed electrical wiring, and defective insulation. Replace a defective lamp receptacle.

(4) Inspect glass panel for cracks, breaks, and chips. Replace if defective.

(5) Inspect spring clips and springs for distortion and fatigue. Replace if defective.

(6) Inspect frame, door frame, and housing for distortion. Replace any unserviceable part.

e. *Reassembly and Installation.*

(1) Connect electrical leads to the base of receptacle (6, fig. 4-8).

(2) Insert receptacle into housing (12) and secure it in place with locknut at base of lamp (5).

(3) Secure housing to van ceiling with screws (11).

(4) Install lamp (5) and door frame (1) as described in paragraph b. above.

(5) Reassemble install the two other van ceiling fixtures in a similar manner.

Section X. MAINTENANCE OF FRAME

4-24. Stowage Box Frame Assembly.

a. *General.* The stowage box is mounted, by means of a metal frame assembly, to the floor of the van body on left side of erdlator tank. Tools, spare parts, accessories, and manuals are stowed in the stowage box.

b. *Removal.*

(1) Unbuckle straps (1 and 3, fig. 4-9) and remove them from stowage box (4).

(2) Lift stowage box (4) from frame assembly (7).

(3) If stowage box is damaged, remove all tools, spare parts, accessories, and manuals from it.

(4) Remove two capscrews (6) and one flat head screw (10) and remove frame assembly (7) from van body (5).

(5) If straps (1 and 3) are damaged or defective, remove two rivets that secure each strap to frame assembly (7) and remove straps.

(6) Remove the other two rivets (8) and remove buckles (9) from ends of straps (3).

(7) Remove strap tips (2) from straps (1).

c. *Cleaning, Inspection, and Repair.*

WARNING

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(1) Clean stowage box and frame assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect stowage box for a broken or defective hinge or latch, damaged wooden side panels, and broken rivets.

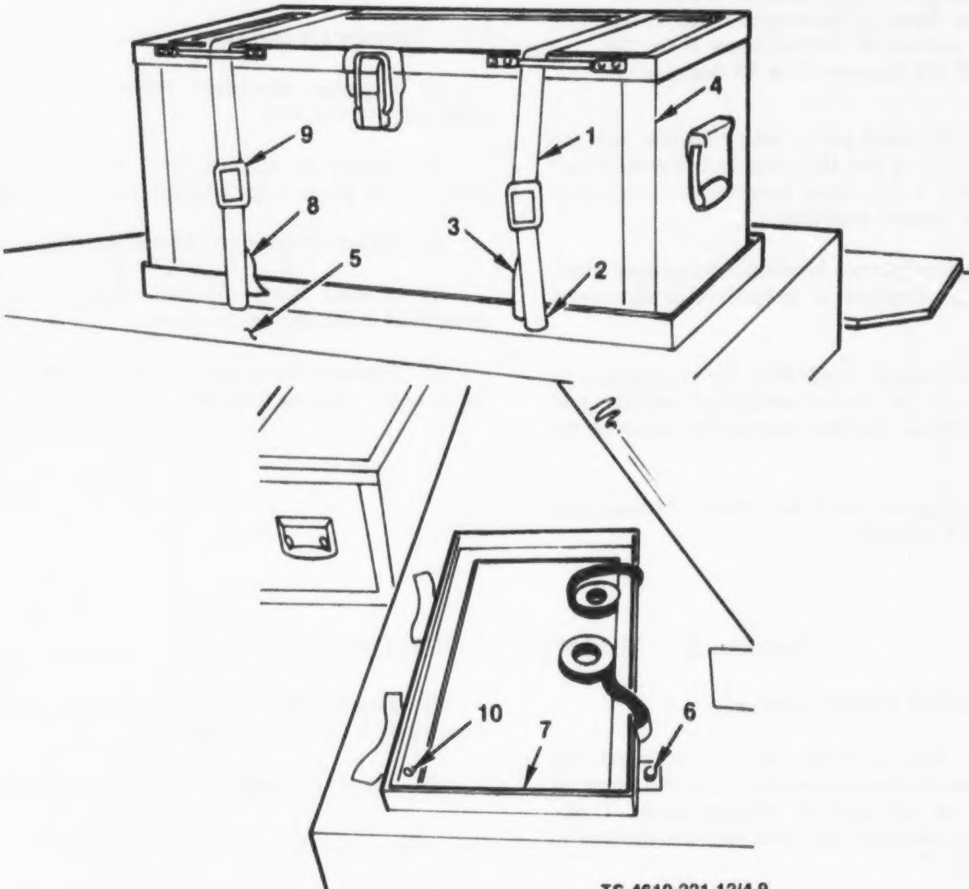

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Figure 4-9. Stowage Box and Base, Removal

Legend for figure 4-9:

1. Strap (2)
2. Strap tip (2)
3. Strap (2)
4. Stowage box
5. Van body
6. Screw, cap, 5/16-18 x 1 1/4 in. (3)
7. Frame assembly
8. Rivet, No. 8 x 1/2 in (12)
9. Buckle (2)
10. Screw, flat head

(3) Inspect frame assembly for cracked or broken welds and distortion. Reweld cracked or broken welds, straighten minor distortion, or replace frame assembly if it is determined unserviceable.

d. Installation

(1) Install strap tips (2, fig. 4-9) on end of straps (1) and crimp them in place.

(2) Fold one end of straps (3) over buckles (9) and rivet straps (3) together with two rivets (8) to secure buckles.

(3) Fold each of the straps (1 and 3) over frame assembly (7) and rivet straps together using two rivets (8).

(4) Install frame assembly (7) on van body (5) and secure with two capscrews (6) and one flat head screw (10).

(5) Install all tools, spare parts, accessories, and manuals in stowage box (4).

(6) Position stowage box (4) on frame assembly (7) and buckle the straps (1 and 3) together to secure stowage box.

4-25. Leveling Jacks and Chain Pin Assembly.

a. General. Four screw type leveling jacks are supplied with each van body. The jacks are used to level and support van body when water purification unit is in operation.

b. Removal of Jack and Chain Pin Assembly.

(1) Turn lever (5, fig. 4-10) counterclockwise on screw (4) until lower base (2) lifts from the ground.

(2) Slide top base (2) from jack holder assembly (1) on van body frame (3) to remove jack assembly from unit. Separate chain from housing (6) and leveling jack pin (9) in the following manner:

(a) Cut chain attaching link (7) as near to housing (6) as possible and open link and remove chain (8) from chain attaching link (7).

(b) Pry loop portion of pin (9) open enough to allow chain ring (10) to drop away from pin.

c. Clean, Inspect and Replace.

WARNING

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(1) Clean all parts in cleaning solvent (item 1, App E).

(2) Inspect jack for cracked housing, bent screw, and other damage.

(3) Replace jack assembly if housing, screw, or bases are damaged. Replace damaged pin and chain.

d. Installation of Jack and Chain Pin Assembly.

(1) Connect chain (8, fig. 4-10) to chain link (7) and leveling jack pin (9) in following manner:

(a) Place the end link of chain (8) in chain attaching link (7) and close link.

(b) Slide chain ring (10) in loop of leveling jack pin (9) and close up loop.

(2) Insert leveling jack pin (9) through applicable hole in housing (6).

(3) Position jack assembly under van body with base (2) inserted in jack holder assembly (1).

(4) Turn level (5) clockwise on jackscrew (4) until lower base (2) is resting firmly on ground.

4-26. Right and Rear Ladder Assemblies.

a. General. The rear ladder assembly is of welded steel construction and permits entrance to van body through rear door. The right ladder assembly is of welded steel construction and allows convenient entrance through right side door.

b. Removal.

(1) Remove rear ladder assembly (7, fig. 1-2) from van body (1).

(2) Remove right ladder assembly (2) from van body (1) or from right side door (4, fig. 4-4)

c. Cleaning, Inspection, and Repair.

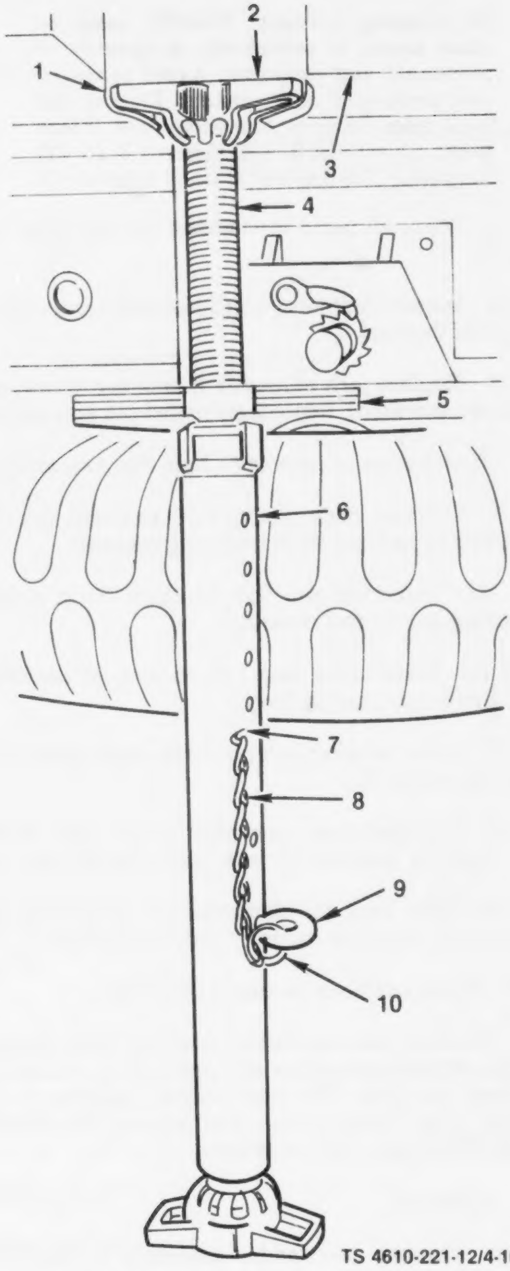

Figure 4-10. Leveling Jack Supporting Van Body

Legend for figure 4-10:

1. Jack holder assembly
2. Base (2)
3. Van body frame
4. Jackscrew
5. Lever
6. Housing
7. Chain attaching link
8. Chain (2 ft.)
9. Leveling jack pin
10. Chain ring

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean the parts of right and rear ladder assemblies with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect right and rear ladder assemblies for cracks and broken welds. Inspect pin attached to right ladder assembly for damage. Replace a damaged pin. Reweld cracks and breaks in right and rear ladder assemblies or replace if beyond repair.

d. Installation.

(1) Install ladder assembly on right side door (4) or on van body (1, fig. 1-2), depending upon whatever application may be desired.

(2) Install rear ladder assembly (7) on or in van body.

Section XI. MAINTENANCE OF BODY, CAB, HOOD, AND HULL

4-27. Leveling Jack Stowage Rack Assemblies.

a. General. The leveling jack stowage rack assem-area found.

b. Removal.

(1) Remove leveling jack assemblies from stowage rack assemblies as described in paragraph 4-2.

(2) Remove two nuts (5, fig. 4-11) from capscrews (8) and remove locking bar (4).

(3) Remove two capscrews (8) from top rack assembly (1).

(4) Remove three screws (3) and lockwashers (2) and remove top rack assembly (1) from front wall of van body.

(5) Remove the other three screws (3) and lockwashers (2) and remove bottom rack assembly (6) from front wall of van body.

(6) If chain (7) is broken or damaged or locking bars (4), top rack assembly (1) or bottom rack assembly (6) are defective, break welds at the ends of chain and separate parts.

c. Cleaning, Inspection, and Replacement.

WARNING

Drycleaining solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of stowage racks with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect all parts of stowage rack assembly for cracks, breaks, distortion, and damaged screw threads. Replace any damaged or defective parts. Inspect chains for weak or cracked links. Replace a damaged chain.

d. Installation.

(1) If chain (7, fig. 4-11) has been detached from locking bar (4) or rack assembly (1 or 6), weld chain to the two parts.

(2) Position bottom rack assembly (6) on front wall of van body and secure with three lockwashers (2) and screws (3).

(3) Position top rack assembly (1) on the front wall of van body and secure wtih three lockwashers (2) and screws (3).

(4) Install capscrew (8) in rack assembly (1 and 6).

(5) Position locking bars (4) on capscrews (8) and secure with nuts (5).

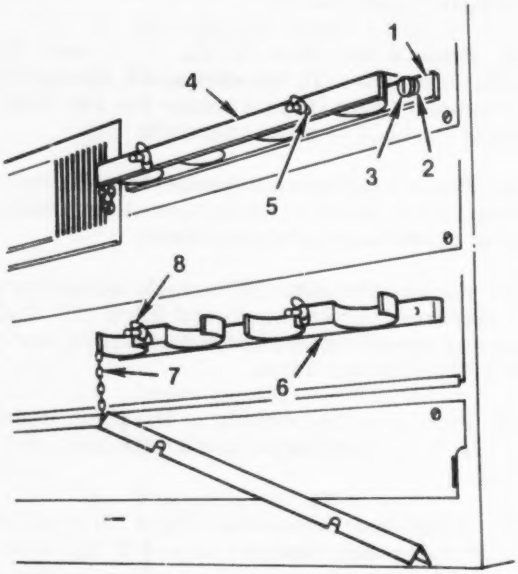

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Figure 4-11. Stowage Rack Assembly

Legend for figure 4-11:

1. Top rack assembly
2. Washer, lock IT, 5/16 in. (4)
3. Screw, tapping, thd-forming, 5/16 x 1 1/2 in. (6)
4. Locking bar (2)
5. Nut, plain, wing, 3/8-16 (2)
6. Bottom rack assembly
7. Chain
8. Screw, cap, 3/8 x 1 1/2 in. (4)

4-28. Van Body Assembly.

a. General. The van body is all metal construction with riveted joints and is insulated throughout with fiberglass. The truck chassis is insulated from van body with hardwood liners and fillers to absorb shock and vibration.

b. Removal.

(1) Disconnect fuel line that supplies heater electric fuel pump from truck chassis gasoline tank.

(2) Disconnect electrical connections between van body and truck chassis.

(3) Remove four nuts (2, fig. 4-12, view A), bolts (7), lockwashers (1), flat washers (6), springs (5) and hardwood fillers (4) that secure the two front corners of van body to chassis frame (8).

(4) Remove eight capscrews (14, view B), lockwashers (13) and washers (12) that secure both sides, at center, of van body to chassis frame.

(5) Remove two nuts (16, view C), lockwashers (17), capscrews (18), and hardwood fillers (19) that secure rear corners of van body to mounting angle bracket (15) of chassis frame.

(6) Place suitable blocking at the point where van body is to be lowered to the ground after removal.

(7) Attach four cable ends (4, fig. 4-13) of cables (5) to lifting shackle brackets (1 and 2, fig. 4-14). Attach cable loops (6, fig. 4-13) of cables to lifting hook (7) of lifting device. A suitable spreader (3) of nine feet in length must be inserted between the pairs of cables.

CAUTION

Never attempt to lift van body by placing cables around bonnet. Always use lifting shackle brackets. Be sure to use a lifting device of no less than 9000 pounds (4082 kg) capacity.

(8) Raise lifting device, slowly lifting van body (2) from truck chassis (1), and lower van body onto blocking.

(9) Remove cables (5) from lifting shackle brackets (1 and 2, fig. 4-14).

(10) Remove two hardwood liners (2, fig. 4-11) from the bed of truck chassis.

c. Inspection and Repair.

(1) Check van body for dents, cracks, gouges, tears, and other damage.

(2) Repair any damaged area found.

d. Installation.

(1) Position two hardwood liners (2, fig. 4-12) on the bed of truck chassis.

(2) Attach four cable ends (4, fig. 4-13) of cables (5) to lifting shackle brackets (1, 2, fig. 4-14). Attach cable loops (6) on cables to lifting hook (7) of lifting device.

(3) Raise lifting device, slowly lifting van body (2) from blocking, and lower it onto truck chassis (1) with mounting holes properly aligned.

(4) Position hardwood fillers (19, fig. 4-12, view C) between mounting angle brackets (15) of van body and truck chassis at each side and at the rear of van body. Secure the rear of van body to truck chassis with two capscrews (18), lockwashers (17), and nuts (16).

(5) Secure each side of van body at center, to mounting bracket (11, view B) of truck chassis with washers (12), lockwashers (13), and capscrews (14).

(6) Secure the front of van body, at each side, to chassis frame (8, view A) with two hardwood fillers (4), nuts (2), lockwashers (1), washers (6) and bolts (7).

(7) Connect electrical connections between van body and truck chassis. Refer to wiring diagram (fig. FO-1).

(8) Connect the fuel line (10, fig. 4-15) that supplies the heater electric fuel pump to the truck chassis gasoline tank.

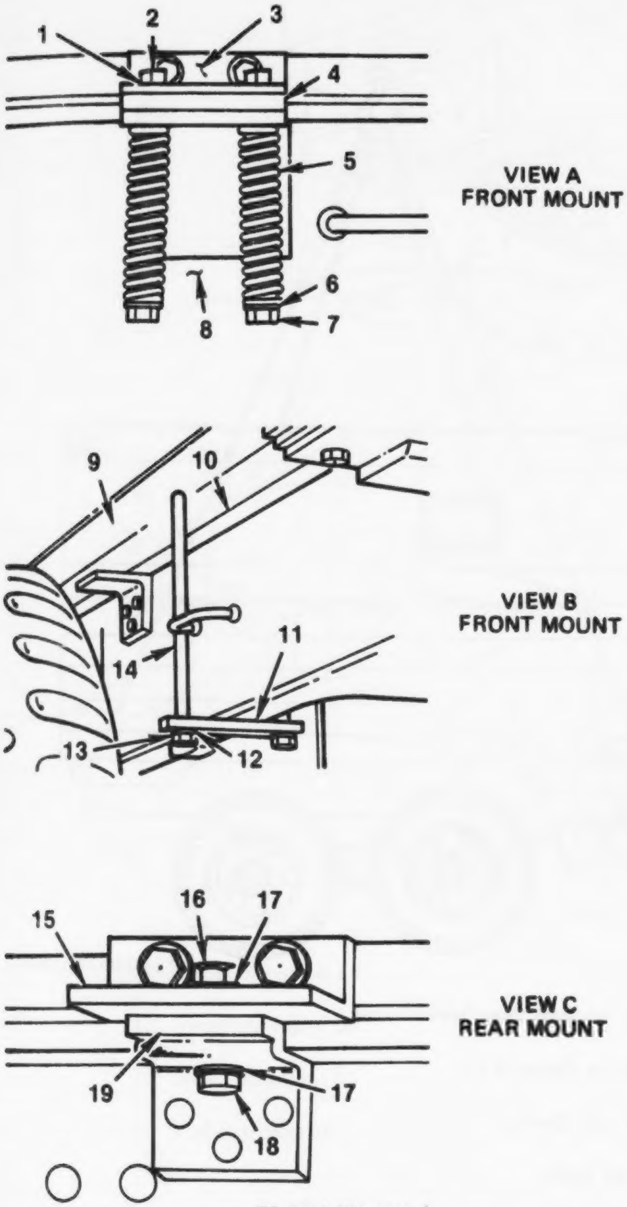
4-29. Outside Door Handles and Latches.

a. General. The right and rear door handles permit opening and latching of right side door and rear door from outside van body. The outside door handles have holes to accommodate a padlock.

b. Removal.

(1) Remove three screws (4, fig. 4-16) and lockwashers (3) and pull straight out on door handle (1), removing it from right side door (2).

(2) Remove door handle from rear door in a similar manner.


1
2
3
4
5
6
7
8
VIEW A
FRONT MOUNT
9
10
11
14
13
12
VIEW B
FRONT MOUNT
15
16
17
19
17
18
VIEW C
REAR MOUNT

TS 4610-221-12/4-12

Figure 4-12. Van Body Mounting Points

Legend for figure 4-12:

1. Washer, lock 5/8 in. (4)
2. Nut, 5/8 in.
3. Mounting angle (2)
4. Hardwood filler (2)
5. Spring (4)
6. Washer, flat, 5/8 in. (4)
7. Bolt, machine, 5/8-11 x 9 in. (4)
8. Chassis frame
9. Van body
10. Hardwood liner (2)
11. Mounting bracket
12. Washer, flat, 5/8 in. (8)
13. Washer, lock, 5/8 in. (8)
14. Screw, cap 5/8-11 x 14 in. (8)
15. Mounting angle bracket
16. Nut, plain, hex, 5/8-11 (2)
17. Washer, lock 5/8 in. (2)
18. Screw, cap, 5/8-11 x 2 in. (2)
19. Hardwood filler (2)

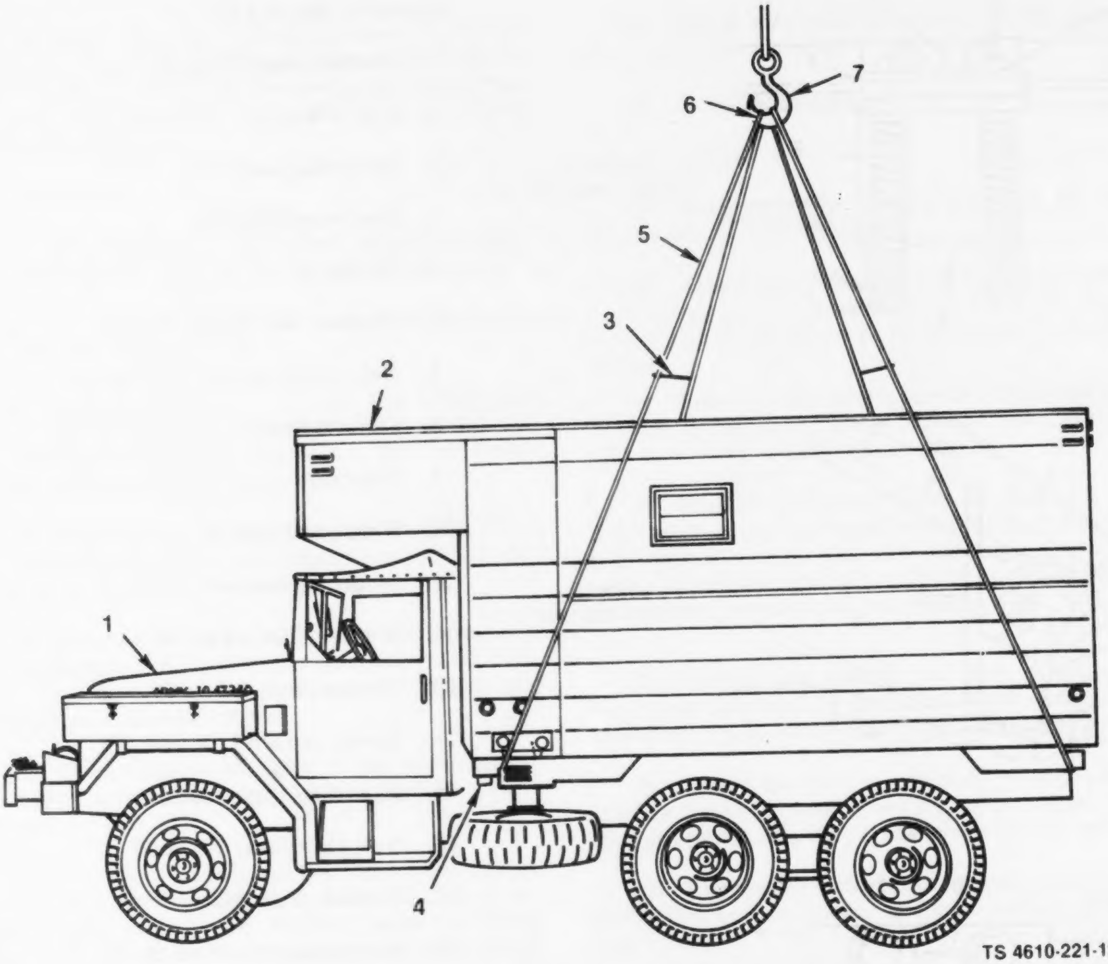
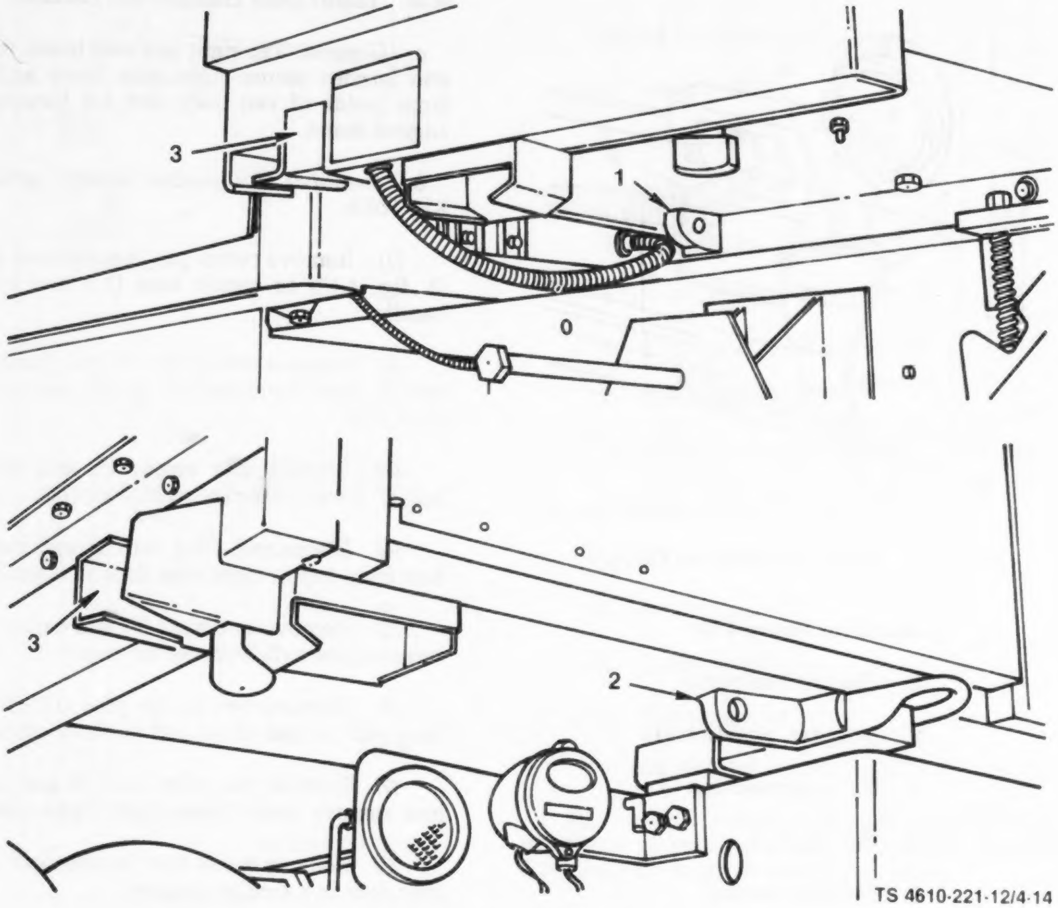

1
2
3
4
5
6
7
TS 4610-221-12/4-13

Figure 4-13. Lifting Van Body from Truck Chassis

Legend for figure 4-13:

1. Truck chassis
2. Van body
3. Cable spreaders (2)
4. Cable hook (4)
5. Cable (4)
6. Cable loop (2)
7. Lifting hook



TS 4610-221-12/4-14

Figure 4-14. Lifting Brackets

Legend for figure 4-14:

1. Front bracket (2)
2. Rear bracket (2)
3. Cable guide (4)

c. *Cleaning and Inspection.*

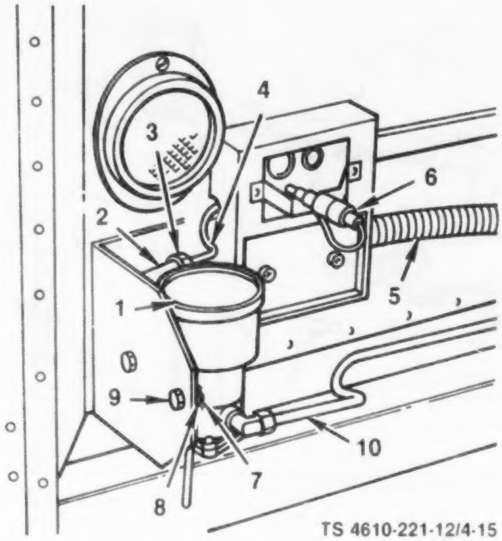
WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean door handles with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect door handles for cracks, breaks, and faulty operation.

(3) Replace a damaged or defective door handle.



TS 4610-221-12/4-15

Figure 4-15. Electric Fuel Pump and Fuel Lines

Legend for figure 4-15:

1. Electric fuel pump
2. Adapter, pipe-to-tube
3. Nut, compression
4. Fuel line
5. Flexible conduit
6. Wire connector
7. Nut, 1/4 x 20 (2)
8. Lockwasher, 1/4 in. (2)
9. Screw, 1/4-20 x 5/8 in. (2)
10. Fuel line

d. Installation.

(1) Position door handle (3, fig. 4-16) on right side of door (2) and engage it with door latch on the other side of door. Secure door handle with three lockwashers (3) and screws (4).

(2) Install the other handle on rear door in a similar manner.

4-30. Inside Door Handles and Latches.

a. General. The right and rear inside door handles and latches secure right side doors and rear door from inside of van body and are located at center edge of doors.

b. Removal (All models except serial numbers 816-1083).

(1) Remove cotter pin that secures door handle (3, fig. 4-17) to center case (11) and remove door handle.

(2) Remove cotter pin (6) and disconnect short rod (5) from latchbolt (7) at bottom of right side door (13).

(3) Remove four screws (8) and remove latchbolt (7) from bottom of right door (13).

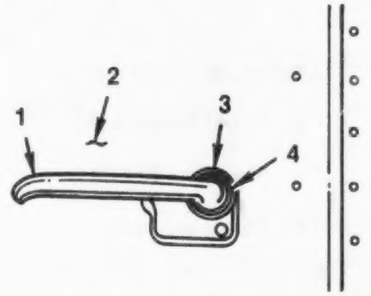
(4) Disconnect long rod (1) and remove latchbolt from top of right side door in a similar manner.

(5) Remove two nuts (9) and capscrews (4) and remove guard (2) from center case (11).

(6) Remove two cotter pins (10), flat washers, long rod (1), and short rod (5) from center case (11).

(7) Remove two other nuts (9) and capscrews (4) and remove center case from right side door (13).

(8) Remove inside door handles and latches from rear door in a similar manner.



TS 4610-221-12/4-16

Figure 4-16. Outside Door Handle

Legend for figure 4-16:

1. Door handle (2)
2. Right side door
3. Washer, lock, No. 10 (6)
4. Washer, sheet-metal, No. 10-12 x 1/2 in. (6)

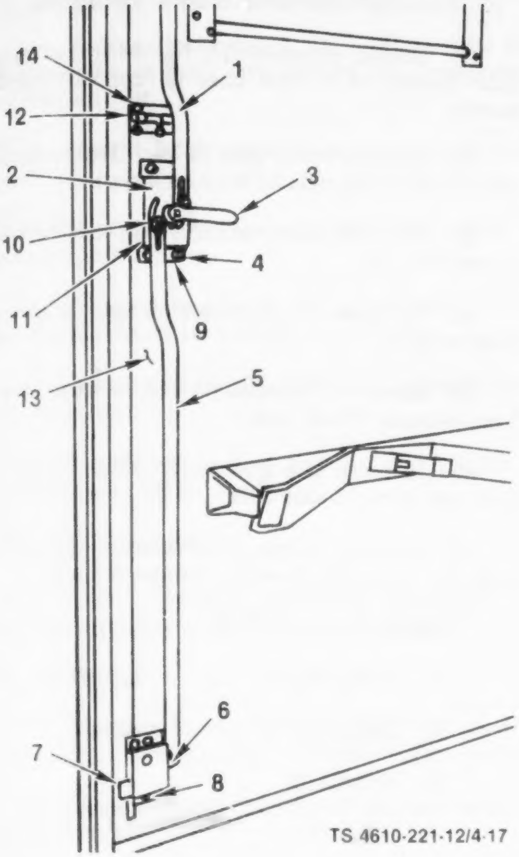


Figure 4-17. Right and Rear Inside Door Handles and Latches (Except Serial Numbers 816-1083)

c. *Cleaning, Inspection, and Repair.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of door handles and latches with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect short rod and long rod for distortion. Straighten minor distortions or replace if otherwise unserviceable.

(3) Inspect door handle for a cracked or broken condition. Replace a damaged door handle.

Legend for figure 4-17:

1. Long rod (2)
2. Guard (2)
3. Handle (2)
4. Screw, cap, 1/4-20 x 3/4 in. (8)
5. Short rod (2)
6. Pin, cotter, 1/16 x 1 in.
7. Latchbolt (2)
8. Screw, self-tapping, 8-32 x 1 in. (16)
9. Nut, plain, hex, 1/4-20 (8)
10. Pin, cotter, 1/16 x 1 in.
11. Center case (2)
12. Night latchbolt
13. Right side door
14. Screw, thd-forming, 1/4-20 x 3/4 in. (4)

(4) Inspect center case and door latches for apparent physical damage and faulty operation. Replace a damaged or defective part.

d. *Installation* (All models except serial numbers 816-1083).

(1) Position center case (11, fig. 4-17) on right side door (13) and secure with two capscrews (4) and nuts (9).

(2) Install long rod (1) and short rod (5) on center case (11) and secure each rod with flat washer and cotter pin (10).

(3) Position guard (2) over center case (11) and secure to right side door (13) with two capscrews (4) and nuts (9).

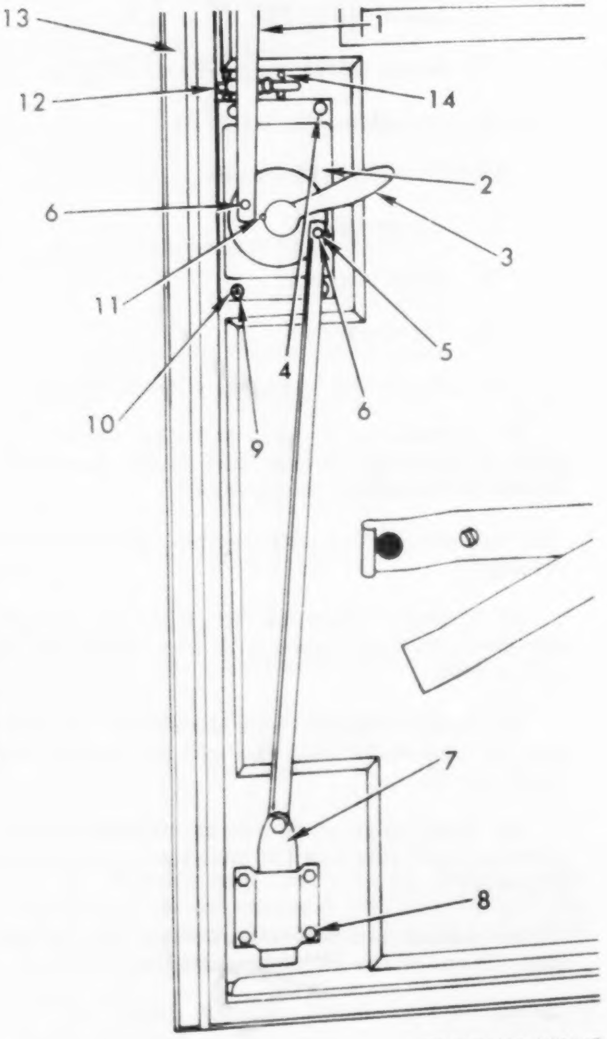
(4) Install latchbolt (7) on bottom of right side door (13) and secure with four screws (8).

(5) Connect short rod (5) to the latchbolt on the bottom of right side door and secure with lockwasher and cotter pin (6).

(6) Install latchbolt to top of right side door and connect long rod (1) in a similar manner.

(7) Install door handle (3) on center case (11) and secure with a cotter pin.

(8) Install inside door handles and latches on rear door in a similar manner.



TS 4610-221-12/4-18

Figure 4-18. Right and Rear Inside Door Handles and Latches (Unit Serial Numbers (816-1083)

e. *Removal* (Unit serial numbers 816-1083).

(1) Loosen setscrew (11, fig. 4-18) that secures door handle (3) to lock case (2) and remove door handle.

(2) Remove cotter pins (6) and disconnect short rods (5) and long rods (1) from lock case.

(3) Separate short rods and long rods from latch assemblies (7).

(4) Remove screws (8) which hold latch assemblies to door.

(5) Remove two nuts (9) and lockwashers (10) from bottom of lock case.

(6) Remove two screws (4) which hold top of lock case to right side door.

(7) Remove inside door handles, latches and lock case from rear door in a similar manner.

Legend for figure 4-18:

1. Long rod (2)
2. Lock case (2)
3. Handle (2)
4. Screw (4)
5. Short rod (2)
6. Cotter pin (4)
7. Latch assemblies (4)
8. Screw (16)
9. Nut (4)
10. Lockwashers (4)
11. Setscrew (2)
12. Night latchbolt
13. Right side door
14. Screw, thd-forming, 1/4-20 x 3/4" (8)

f. Installation (Unit serial numbers 816-1083).

(1) Position lock case (2, fig. 4-18) on right side door and secure with two screws (4), lockwashers (10) and nuts (9).

(2) Install latch assemblies (7) to door with screws (8).

(3) Position long rods (1) and short rods (5) into latch assemblies.

(4) Connect long rods and short rods to lock case shaft with cotter pins (6).

(5) Install door handle (3) on lock case and secure with setscrew (11).

(6) Install inside door handles and latches on rear door in a similar manner.

4-31. Night Latchbolt.

a. General. The night latchbolts are used to lock rear and right side doors from inside van body.

b. Removal.

(1) Remove four screws (14, fig. 4-17 or 4-18) and remove night latchbolt (12) from right side door.

(2) Remove night latchbolt from rear door in a similar manner.

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean night latchbolt with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Replace a damaged or defective night latchbolt.

d. Installation

(1) Install night latchbolt (12, fig. 4-17 or 4-18) on right side door and secure with four screws (14).

(2) Install night latchbolt on rear door in a similar manner.

4-32. Rear Door Grab Handle.

a. General. The rear door grab handle is mounted inside of rear door and provides a handhold for personnel entering through rear door.

b. Removal. Remove four screws (9, fig. 4-19) and remove grab handle (10) from rear door (14).

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

Clean the rear door grab hancle with cleaning solvent (item 1, App. E) and dry thoroughly. Replace a damaged or defective rear door grab handle.

d. Installation. Position grab handle (10) to inside of rear door (14) and secure with four screws (9).

4-33. Left Door Handles, Locks, and Bumpers.

a. General. The two left door handles and locks are located on each corner of upper left door. The door handles provide a means of closing doors and locks retain doors in a closed position.

b. Removal.

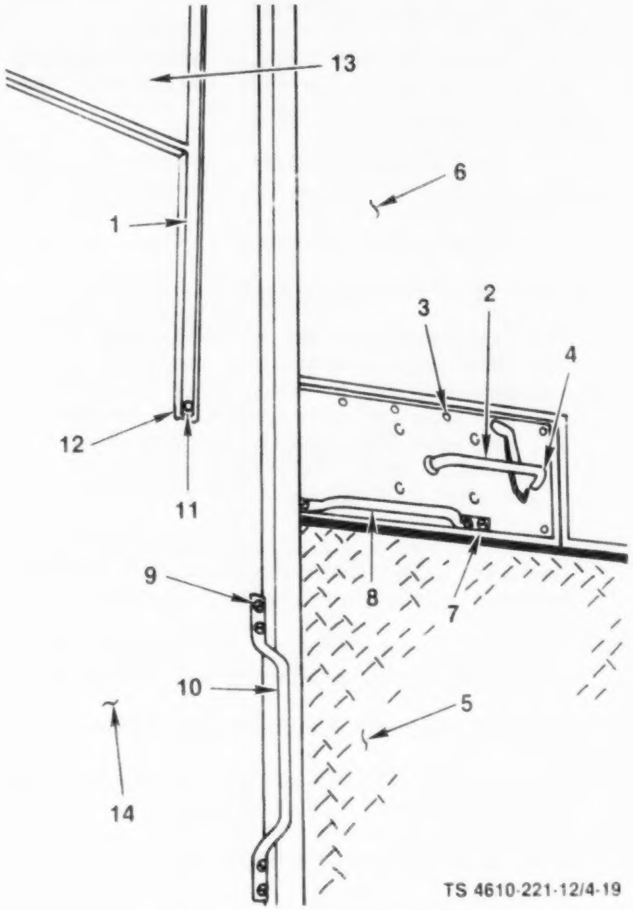
(1) Pull cotter pin (4, fig. 4-19) that secures two door lock handles (2) and open lower left door (5) and upper left door (6).

(2) Remove four screws (7) and remove door handle (8) from door lock plate.

(3) Remove 16 screws (3) and lockwashers; at the same time, remove cotter pin (4) with attached chain, and remove the door lock from upper left door (6).

(4) Remove the other door handle and lock in a similar manner.

(5) Remove the three bumpers from upper left door in a similar manner as described in paragraph 4-43.



Legend for figure 4-19:

1. Guard assembly (3)
2. Door lock handle (2)
3. Screw, cap, 1/4-20 x 3/4 in. (32)
4. Cotter pin (2)
5. Lower left door
6. Upper left door
7. Screw, sheet-metal, No. 14 x 1/2 in. (8)
8. Door handle (2)
9. Screw, sheet-metal, No. 8 x 3/4 in. (4)
10. Grab handle
11. Screw, self-tapping, No. 8 x 1 in. (6)
12. Spacer
13. Blackout panel (3)
14. Rear door

Figure 4-19. Blackout Panel and Door Handles

c. *Disassembly.*

(1) Remove nut (2, fig. 4-20) from rear of center box (3) and remove handle (17) and spacer (19) from center box (3) and lock mounting plate (20).

(2) Remove four nuts (7) and screws (11) and remove lock bracket (8) and filler plate (10) from lock mounting plate (20).

(3) Remove four nuts (1) and screws (18) and remove center box (3) with attached tongue (9) from lock mounting plate (20).

(4) Mark positon of tongue (9) in yoke (5). Loosen nut (2) and remove tongue (9) from yoke. Remove lockwasher and nut (2) from tongue.

(5) Remove lockring (4) that secures yoke pin (21). Remove yoke pin and separate yoke (5) from center box (3).

(6) Separate cotter pin (15) from chain (14).

(7) Disassemble the other lock in a similar manner.

d. *Cleaning, Inspection, and Repair.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean door handle and all parts of door lock with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect mechanical action of center box. Replace a defective center box.

(3) Inspect lock mounting plate, filler plate, and lock bracket for bends and dents. Straighten minor bends or replace any unserviceable part.

(4) Inspect door handle, tongue, and yoke for cracks and breaks or damaged screw threads. Replace a damaged or defective part.

e. Reassembly

(1) Position yoke (5, fig. 4-20) on center box (3), aligning pinholes in each. Insert yoke pin (21) through aligned hole and secure with lockring (4).

(2) Install nut (2) and lockwasher (6) on tongue (9). Screw tongue (9) into yoke (5) to a length as previously marked and tighten nut (2) down against yoke to secure.

(3) Position center box (3), with attached tongue (9), on lock mounting plate (20) and secure with four screws (18) and nuts (1).

(4) Position filler plate (10) against mounting plate (20) and under tongue (9) and position lock bracket (8) over tongue. Secure lock bracket and filler plate with four screws (11) and nuts (7).

(5) Insert handle (17) through spacer (19) and into lock mounting plate (20) and center box (3). Secure handle at rear of center box with nut (2).

(6) Install cotter pin (15) on chain (14).

4-34. Stationary Windows and Blackout Panels.

a. General. There are two stationary windows in the water purification unit. One stationary window is located in the right side door and the other stationary window is located in the upper left door. The stationary windows have a sealed double window glass to prevent accumulation of moisture and fog. They are provided with sliding metal panels to cover windows for blackout operation.

b. Removal (All units except 816-1083).

(1) Remove two screws (9, fig. 4-21) and lockwashers and slide blackout panel (6) out of guides (7 and 24).

(2) Remove 15 screws (8) and lockwashers and remove right guide (7), left guide (24), and top guide (5) from right side door (10).

(3) Remove 14 screws (5, fig. 4-22) and lockwashers and remove brush guard (4) from outside of right side door (6). Remove stationary window assembly (1) from right side door.

(4) Remove the other stationary window and blackout panel from upper left door in a similar manner.

c. Disassembly (All units except 816-1083).

(1) Remove 14 screws (10, fig. 4-23) and lockwashers (8) and separate stationary sash (2) from window sash (5).

(2) Remove window glass unit (4) and two clips (9) from window sash (5).

(3) Remove glazing rubber (3) from around window glass unit (4).

(4) Remove two catches (15) from blackout panel (14).

(5) Disassemble other stationary window and blackout panel in a similar manner.

d. Cleaning, Inspection, and Repair (All units except 816-1083).

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

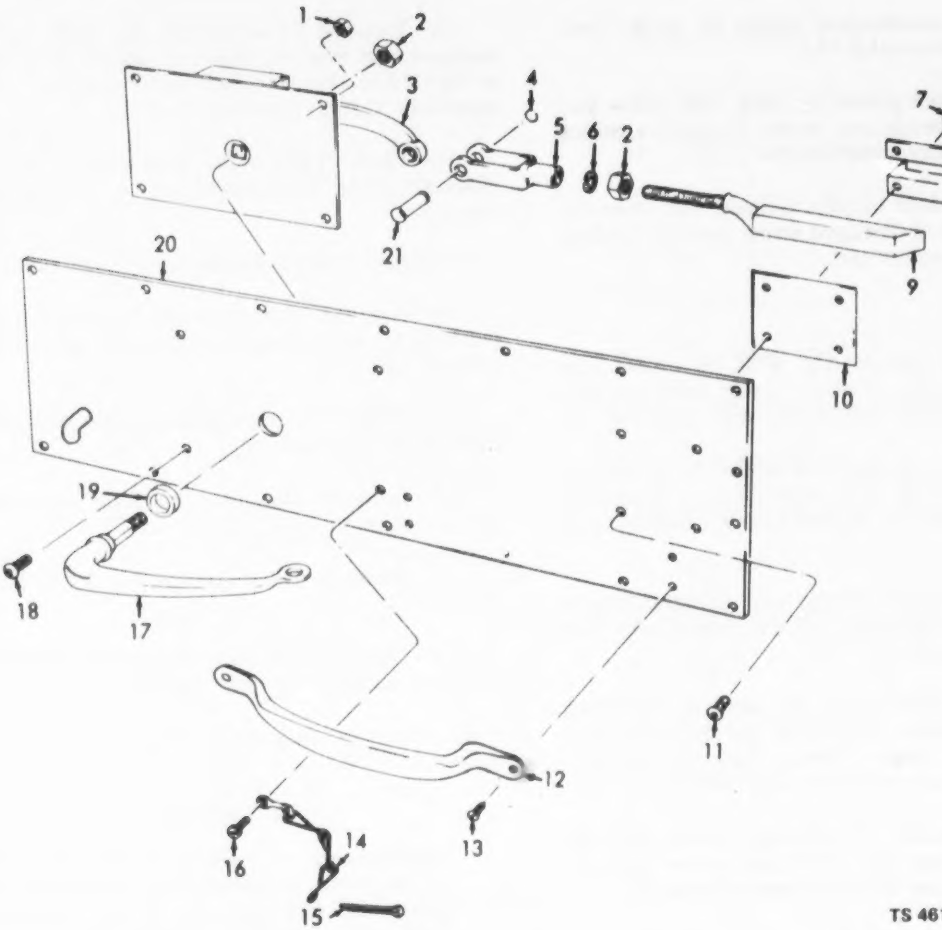
(1) Clean all metal parts of stationary window and blackout panel with cleaning solvent (item 1, App. E) and dry thoroughly. Blow foreign material from air vent with clean, dry air.

(2) Inspect all metal parts of stationary window and blackout panel for cracks, breaks, dents, distortion, and damaged screw threads. Replace all damaged or defective parts.

(3) Inspect window glass unit for cracks, breaks, chips, and a broken seal between two panes of window glass. Replace a damaged or defective window glass unit.

e. Reassembly (All units except 816-1083).

(1) Install two catches (15, fig. 4-23) in blackout panel (14).



TS 4610-221-12/4-20

Figure 4-20. Left Door Handle and Lock, Exploded View

Legend for figure 4-20:

1. Nut, hex, 5/16-18 (8)
2. Nut, hex, 1/2-13 (4)
3. Center box (2)
4. Lockring (2)
5. Yoke (2)
6. Washer, lock, 1/2 in (2)
7. Nut, self-locking, hex, 1/4-20 (8)
8. Lock bracket (2)
9. Tongue (2)
10. Filler plate (2)
11. Screw, machine, 1/4-20 x 3/4 in. (8)
12. Door handle (2)
13. Screw, thd-forming, No. 14-10 x 3/4 in. (8)
14. Chain (2)
15. Pin, cotter, 1/8 x 1 1/2 in (2)
16. Screw machine, thd-forming No. 14 x 3/4 in (8)
17. Handle (2)
18. Screw, machine, 5/16-18 x 3/4 in (8)
19. Spacer (2)
20. Lock mounting plate (2)
21. Yoke pin (2)

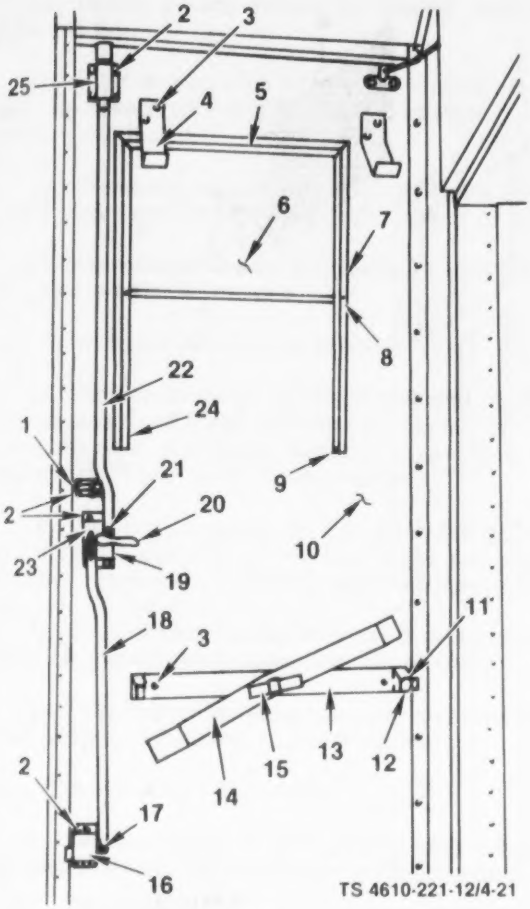


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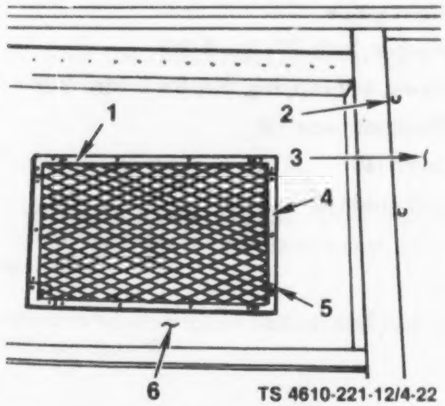
Figure 4-21. Ladder Hangers, Blackout Panel and Door Latches (All Units Except 816-1083)



TS 4610-221-12/4-22

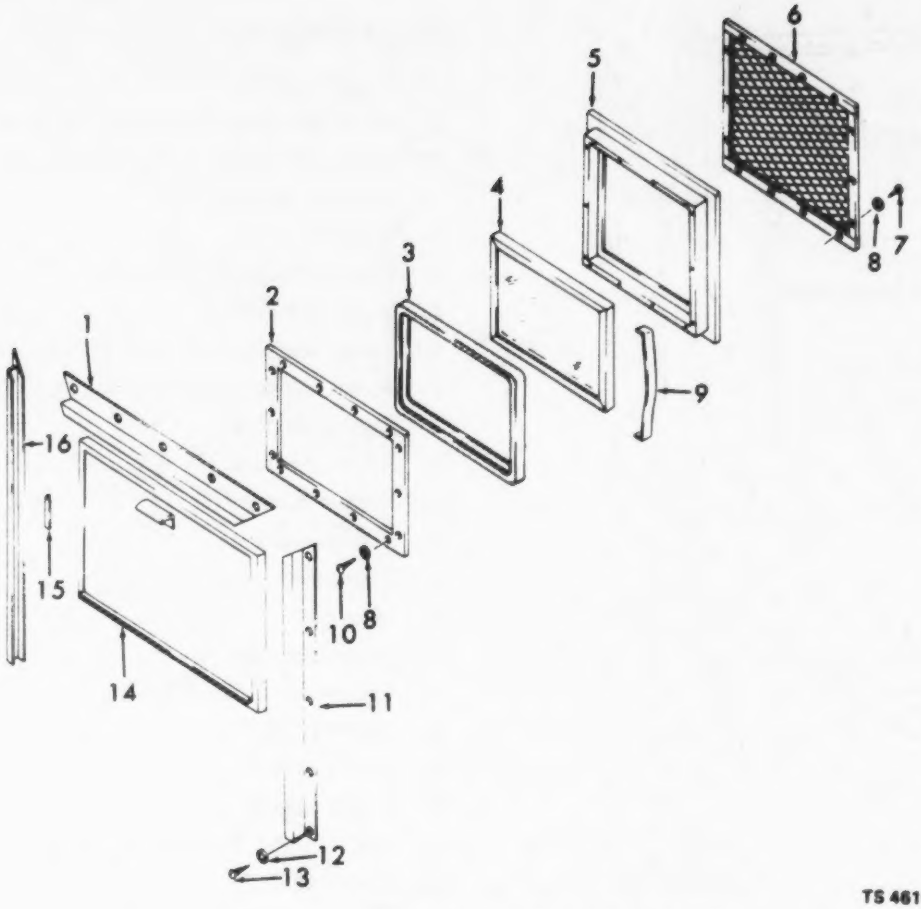
Figure 4-22 Stationary Window

Legend for figure 4-21:

1. Night latchbolt
2. Screw, thd-forming, No. 14 x 3/4 in. (16)
3. Screw, self-tapping, 5/16-18 x 1 in. (8)
4. Ladder hanger (2)
5. Top guide (3)
6. Blackout panel (3)
7. Right guide (3)
8. Screw, self-tapping, No. 8 x 3/4 in. (45)
9. Screw, self-tapping, No. 8 x 1 in. (6)
10. Right side door
11. Screw, machine, No. 8-32 x 1/2 in. (2)
12. Rubber bumper (2)
13. Ladder bracket
14. Clamp
15. Wingnut
16. Latch assembly (2)
17. Pin, cotter, 1/16 x 1/2 in. (8)
18. Short rod (2)
19. Center case (2)
20. Handle (2)
21. Pin, straight, headless, 1/8 x 3/4 in. (2)
22. Long rod (2)
23. Cover plate (2)
24. Left guide (3)
25. Latch assembly (2)

Legend for figure 4-22:

1. Stationary window assembly (2)
2. Fastener (4)
3. Bonnet door (2)
4. Brush guard (2)
5. Screw, thd-forming, No. 8 x 1 in. (28)
6. Right side door



TS 4610-221-12/4-23

Figure 4-23. Stationary Window, Exploded View

Legend for figure 4-23:

1. Top guide (2)
2. Stationary sash (2)
3. Glazing rubber (2)
4. Window glass unit (2)
5. Window sash (2)
6. Brush guard (2)
7. Screw, thd-forming, No. 8 x 1 in (28)
8. Washer, lock, No. 8 (28)
9. Clip (4)
10. Screw, wood, No. 8 x 5/8 in. (28)
11. Right guide
12. Washer, lock, IT, No. 8 (30)
13. Screw, self-tapping, No. 8 x 3/4 in. (30)
14. Blackout panel (2)
15. Catch (4)
16. Left guide (2)

(2) Install glazing rubber (3) around window glass unit (4).

(3) Position two clips (9) on each window glass unit. Compress clips (9) and install window glass unit in window sash (5).

(4) Position stationary sash (2) on window sash (5) and secure with 14 lockwashers (8) and screws (10).

(5) Assemble other stationary window and blackout panel in a similar manner.

f. Installation (All units except 816-1083).

(1) Position stationary window assembly (1, fig. 4-22) in outside of right side door (6). Install brush guard (4) over stationary window assembly and secure with 14 screws (5) and lockwashers.

(2) Position top guide (5, fig. 4-21), left guide (24), and right guide (7) on inside of right side door (10) and secure with 15 lockwashers and screws (8).

(3) Slide blackout panel (6) between two guides (7 and 24). Install two lockwashers and screws (9).

(4) Install other stationary window and blackout panel to upper left door in a similar manner.

g. Removal (Units 816-1083).

(1) Remove screws (9, fig. 4-24) and lockwashers and slide blackout panel (6) out of guides (7 and 22).

(2) Remove screws (8) and lockwashers and remove right guide (7), left guide (22), and top guide (5) from right side door (10).

(3) Remove 14 screws (5, fig. 4-22) and lockwashers and remove brush guard (4) from the outside of right side door (6). Remove stationary window assembly (1) from the right side door.

(4) Remove the other stationary window and blackout panel from the upper left door in a similar manner.

h. Disassembly (Units 816-1083).

(1) Remove 14 screws (10, fig. 4-23) and lockwashers (8) and separate the stationary sash (2) from window sash (5).

(2) Remove window glass unit (4) and two clips (9) from window sash (5).

(3) Remove glazing rubber (3) from around window glass unit (4).

(4) Remove two catches (15) from blackout panel (14).

(5) Disassemble other stationary window and blackout panel in a similar manner.

i. Cleaning, Inspection, and Repair (Units 816-1083).

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all metal parts of the stationary window and blackout panel with cleaning solvent (item 1, App. E) and dry thoroughly. Blow foreign material from air vent with clean, dry air.

(2) Inspect all metal parts of stationary window and blackout panel for cracks, breaks, dents, distortion, and damaged screw threads. Replace all damaged or defective parts.

(3) Inspect window glass unit for cracks, breaks, chips, and a broken seal between the two panes of window glass. Replace a damaged or defective window glass unit.

j. Reassembly (Units 816-1083).

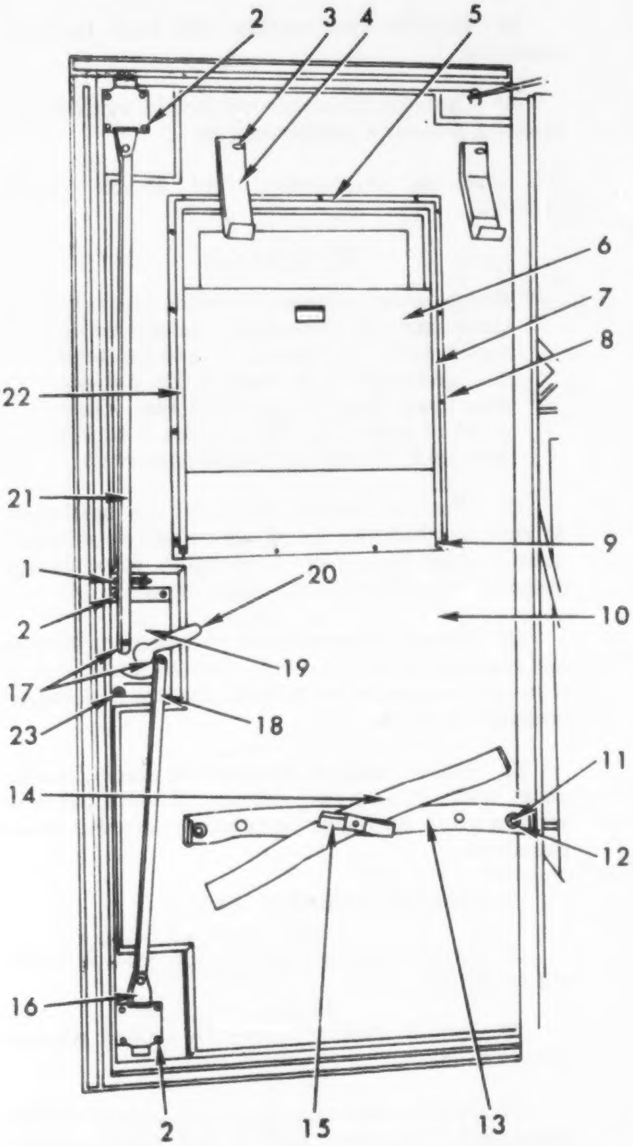
(1) Install two catches (15, fig. 4-23) in blackout panel (14).

(2) Install glazing rubber (3) around window glass unit (4).

(3) Position two clips (9) on each side of window glass unit. Compress clips (9) and install window glass unit in window sash (5).

(4) Position stationary sash (2) on window sash (5) and secure with 14 lockwashers (8) and screws (10).

(5) Assemble other stationary window and blackout panel in a similar manner.



TS 4610-221-12/4-24

Figure 4-24. Ladder Hangers, Blackout Panel and Door Latches (Unit Serial Numbers 816-1083)

Legend for figure 4-24:

1. Night latchbolt
2. Screw, self-tapping, hex hd, 1/4 x 3/4" long (20)
3. Screw, flat head 5/16 x 1" long (8)
4. Ladder hanger (2)
5. Top guide (2)
6. Blackout panel (2)
7. Right guide (2)
8. Screw, self-tapping, 10-24 x 1" (30)
9. Screw, self-tapping, #8 x 1" (4)
10. Right side door
11. Screw, machine, 8-32 x 1/2" long (2)
12. Rubber bumper (2)
13. Ladder bracket
14. Clamp
15. Wingnut
16. Latch assembly (4)
17. Pin, cotter, 1/16 x 1/2" (4)
18. Short rod (2)
19. Center case (2)
20. Handle (2)
21. Long rod (2)
22. Left guide (2)
23. Nut, hex head, 1/4-20 (4)

k. Installation (Units 816-1083).

(1) Position stationary window assembly (1, fig. 4-22) in the outside of right side door (6). Install brush guard (4) over stationary window assembly and secure with 14 screws (5) and lockwashers.

(2) Position top guide (5, fig. 4-24) left guide (22), and right guide (7) on the inside of right side door (10) and secure with 15 lockwashers and screws (8).

(3) Slide blackout panel (6) between two guides (7 and 22). Install two lockwashers and screws (9).

(4) Install other stationary window and blackout panel to upper left door in a similar manner.

4-35. Ventilating Window and Blackout Panel.

a. General. The ventilating window is located in rear door and is adjustable from inside of door. The ventilating window has a sealed double window glass to prevent accumulation of moisture and fog. It is provided with a sliding metal panel to cover window for blackout operation.

b. Removal and Disassembly.

(1) Remove 18 screws (16, fig. 4-25) and lockwashers and remove ventilating window from rear door.

(2) Remove four screws (15) and remove guard assembly (1) from front swing sash (14).

(3) Remove cotter pin (4) and separate arm of regulator (9) from rear swing sash (5).

(4) Remove two cotter pins (2) and remove front and rear swing sash (5 and 14), with glass unit (10), from screen assembly (3).

(5) Remove 14 screws (8) and separate rear swing sash (5) and glass unit (10) from front swing sash (14).

(6) Remove glazing rubber (11) from around glass unit (10).

(7) Remove screws and remove regulator (9) from either side of screen assembly (3).

(8) Remove rivets (12) and remove weatherstrip (13) from front swing sash (14).

(9) Remove and disassemble blackout panel and guide assembly in a manner similar to that described in paragraph 4-34.

C. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all metal parts of ventilating window and blackout panel with cleaning solvent (item 1, App. E) and dry thoroughly. Inspect all metal parts of ventilating window and blackout panel for cracks, breaks, dents, distortion, and damaged screw threads. Straighten minor dents or bends or replace if otherwise defective.

(2) Inspect glass unit for cracks, breaks, chips, and a broken seal between the two panes of glass. Replace a damaged or defective window glass unit.

(3) Inspect the mechanical action of the regulator. Replace the regulator if difficulty in operation is observed or apparent physical damage exists.

d. Reassembly and Installation.

(1) Position weatherstrip (13, fig. 4-25) on front swing sash (14) and secure weatherstrip with rivets (12).

(2) Assembly regulator (9) to screen assembly (3) and secure with two screws.

(3) Install glazing rubber (11) around glass unit (10).

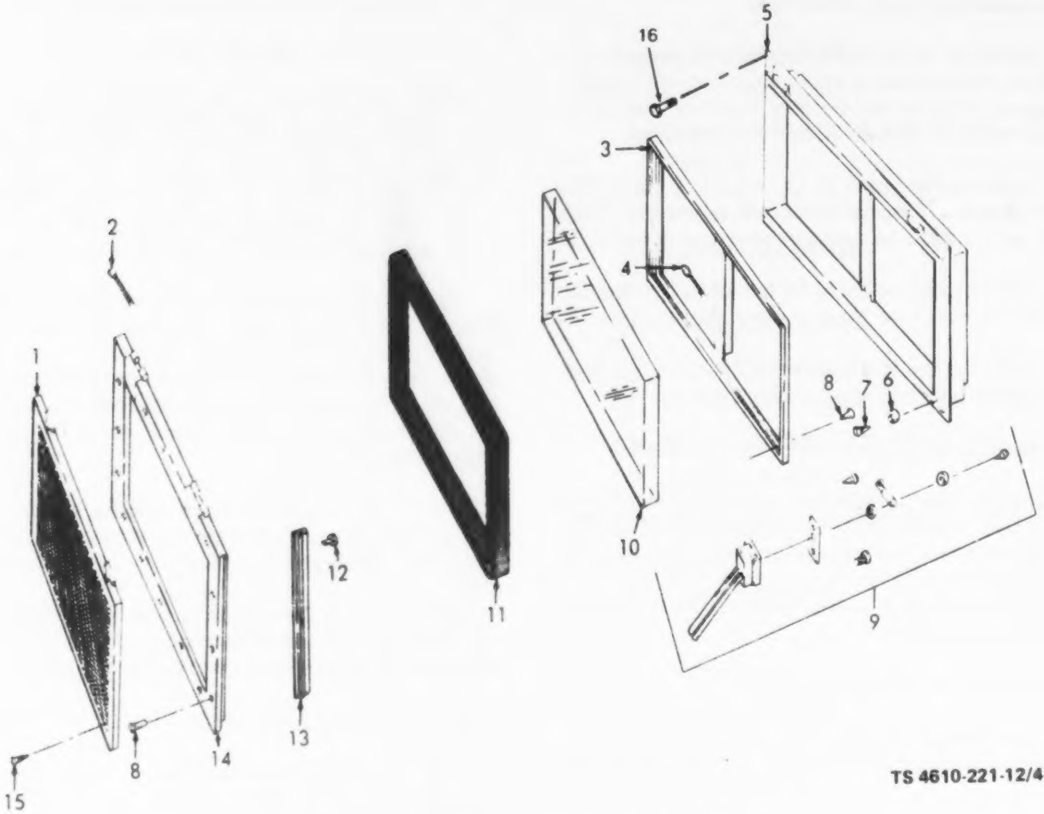
(4) Assemble glass unit (10) between front swing sash (14) and rear swing sash (5) and secure together with 14 screws (8).

(5) Position front and rear swing sash (14 and 5), with glass unit assembled, on screen assembly (3) and hinge with two cotter pins (2).

(6) Engage arm of regulator (9) with rear swing sash (5) and secure with cotter pin (4).

(7) Position ventilating window in rear door and secure with 18 lockwashers and screws (16).

(8) Reassemble and install blackout panel and guide assembly in a manner similar to that described in paragraph 4-34.



TS 4610-221-12/4-25

Figure 4-25. Ventilating Window, Explosed View

Legend for figure 4-25:

1. Guard assembly
2. Pin, cotter, 1/8 x 3 in. (2)
3. Screen assembly
4. Pin, cotter, 1/16 x 2 1/4 in.
5. Rear swing sash
6. Washer, lock, No. 10 (33)
7. Screw, thd-forming, No. 10-12 x 1/2 in (33)
8. Screw, thd-forming, No. 10-12 x 5/8 in. (30)
9. Regulator
10. Glass unit
11. Glazing rubber
12. Rivet (as reqd)
13. Weatherstrip
14. Front swing sash
15. Screw, wood, No. 8-15 x 5/8 in. (4)
16. Screw, thd-forming, No. 8 x 1 in (18)

4-36. Doors.

Three doors provide entrance into van body. The right door and rear door are of conventional type. The left door is a divided type and lower section is used as an operating platform during clement weather. The van is equipped with doors on either side, which provide access to personnel heater. All doors are fiberglass insulated and are sealed for blackout operation.

4-37. Upper and Lower Left Doors.

a. *Upper Door Removal.*

(1) Remove stationary window (para 4-34), door handles (para 4-33), latches (para 4-31), and left door counterbalance (para 4-38).

(2) Remove 25 screws (2, fig. 4-26) and remove upper door (3) from van body (4).

b. *Upper Door Disassembly.*

(1) Remove 25 screws (2, fig. 4-27) and remove door hinge (1) and hinge seal (3) from upper door (4).

(2) Remove 50 rivets (7) and remove three reinforcing bars (5 and 9) and door seals (6 and 10) from upper door (4).

(3) Remove seal moldings (8 and 11) from door seals (6 and 10).

c. *Lower Door Removal and Disassembly.*

(1) Remove left door counterbalance (para 4-38).

(2) Remove 11 screws (1, fig. 4-28) that secure outside of lower door (3) to van body (2).

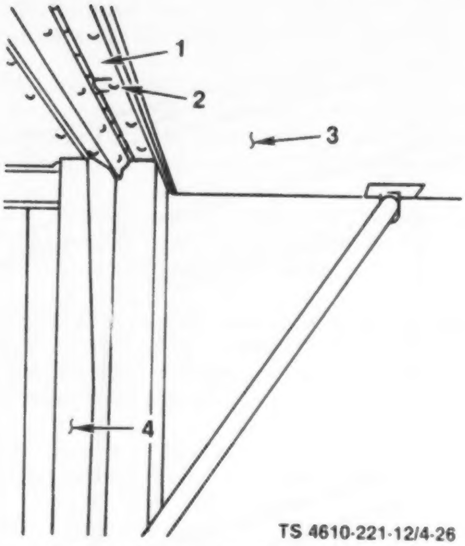
(3) Remove 15 screws (1, fig. 4-29) and nuts that secure lower door (2) inside van body (3) and remove lower door.

(4) Remove the three door hinges and door seals in a similar manner to that described in paragraph b. above.

d. *Cleaning, Inspection, and Repair.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).



TS 4610-221-12/4-26

Figure 4-26. Upper Left Door, Removal

Legend for figure 4-26:

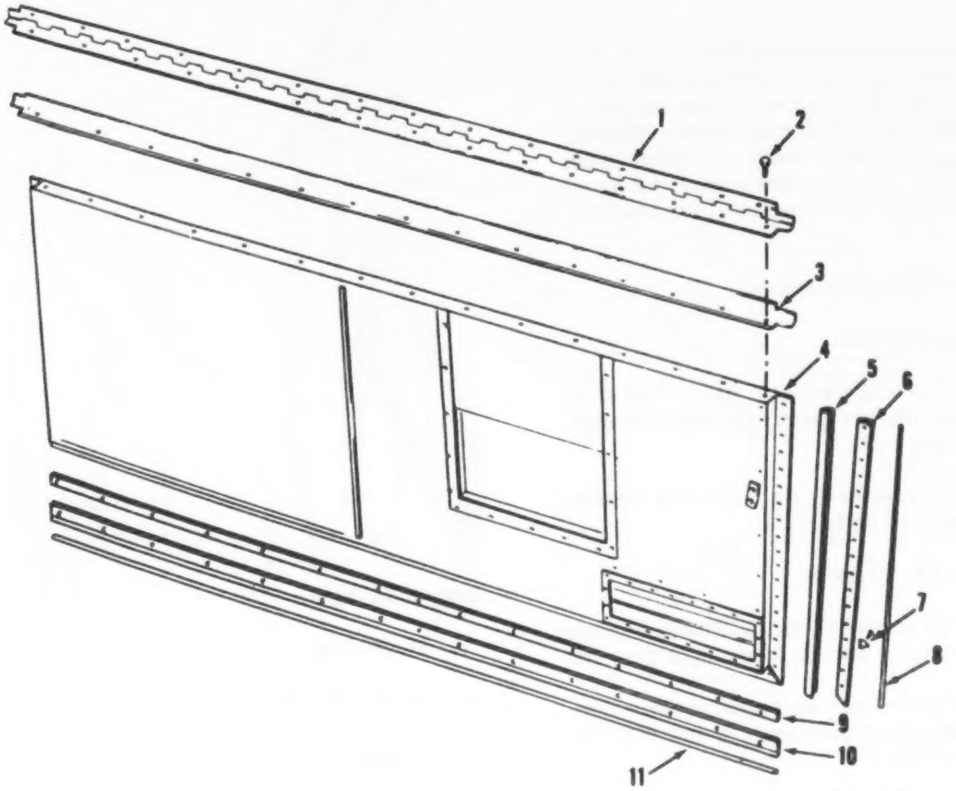
1. Door hinge
2. Screw, thd-forming, No. 14-14 x 3/4 in. (25)
3. Upper door
4. Van body

(1) Clean all metal parts of upper and lower left doors with cleaning solvent (item 1, App. E). Clean seals and moldings with a nonmineral base cleaning solvent (item 3, App. E) or a solution of soap and warm water.

(2) Inspect door hinges for cracks, breaks, and a restricted hinge action. Replace a damaged or defective hinge.

(3) Inspect hinge seals, door seals, and seal molding for cracks, breaks, and deterioration. Replace damaged seals and moldings.

(4) Inspect upper and lower left doors for loose or missing rivets, separated seams, dents, and distortions of the upper and lower left doors, replace loose or missing rivets, or replace entire door if damaged beyond repair.



TS 4610-221-12/4-27

Figure 4-27. Upper Left Door, Exploded View

Legend for figure 4-27:

1. Door hinge
2. Screw, thd-forming, No. 14-14 x 3/4 in. (25)
3. Hinge seal
4. Upper door
5. Reinforcing bar (2)
6. Door seal (2)
7. Rivet, drive 3/16 x 1/4 in. (50)
8. Seal molding (2)
9. Reinforcing bar
10. Door seal
11. Seal molding

e. Upper Door Reassembly.

(1) Insert seal moldings (8 and 11, fig. 4-27) into door seals (6 and 10).

(2) Position 2 door seals (6) and door seal (10) to upper door (4). Place reinforcing bars (5 and 9) over door seals and secure to upper door 50 rivets (7).

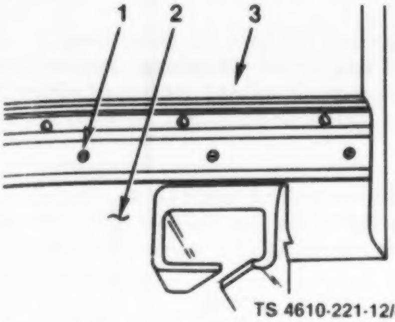
(3) Position hinge seal (3) and door hinge (1) to upper door (4) and secure with 25 screws (2).

f. Upper Door Installation.

(1) Position upper door (3, fig. 4-26) to van body (4) and secure with 25 screws (2).

(2) Install stationary window, door handles, latches, and left door counterbalance.

g. Lower Door Reassembly and Installation.



TS 4610-221-12/4-28

Figure 4-28. Lower Left Door, Outside, Removal

Legend for figure 4-28:

1. Screw, thd-forming, No. 14-15 x 3/4 in. (11)
2. Van body
3. Lower door

(1) Install three door hinges and door seals on lower door in a similar manner to that described in paragraph e. above.

(2) Position lower door (2, fig. 4-29) to van body (3) and secure inside of door with 15 screws (1).

(3) Secure outside of lower door (3, fig. 4-28) to van body (2) with 11 screws (1).

(4) Install left door counterbalance (para 4-38).

4-38. Left Door Counterbalance.

a. *General.* The left door counterbalances support upper left door and lower left door in the opened position and permits them to be closed simultaneously.

b. *Adjustment.* Adjust upper left door to allow lower left door to close first and upper door to fold over bottom door, closing together simultaneously. Turn turnbuckle barrel (12, fig. 4-30) clockwise to elevate upper left door and counterclockwise to lower upper left door.

c. *Removal and Disassembly.*

(1) Support lower left door (5, fig. 4-30) and upper left door (18, fig. 4-31) to prevent them from closing or falling when counterbalances are removed.

(2) Remove nut (2), washer (1), and screw (3) and disconnect upright arm (14) from arm mounting angle (17).

(3) Remove two screws (19) and remove arm mounting angle (17) from upper left door (18).

(4) Remove cotter pin (2, fig. 4-30) from pin (4) and remove pin (4) and washer (9) separating folding arms (1 and 10) from lower left door (5). At the same time disconnect terminal (11) from lower left door.

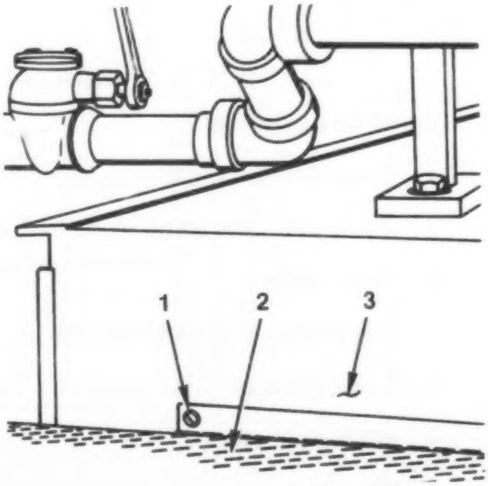
(5) Remove other cotter pin (2) from pin (4) and remove pin, separating cable roller (3) and folding arms (1 and 10) from van body.

(6) If the upper or lower folding arm is damaged, grind the heads off two rivets (8) and remove rivets and washers (9), separating upper folding arm (1) from lower folding arm (10).

(7) Remove two screws (12, fig. 4-31) and remove guides (11) from van body (10).

(8) Remove cotter pin from pin (4). Remove pin (4) and remove roller (6) and, as an assembly, cable bar (9), cable (7), and upright arm (14) from van body (10).

(9) Remove nut (16), washer (15), and capscrew (8) and disconnect cable (7) from cable bar (9).

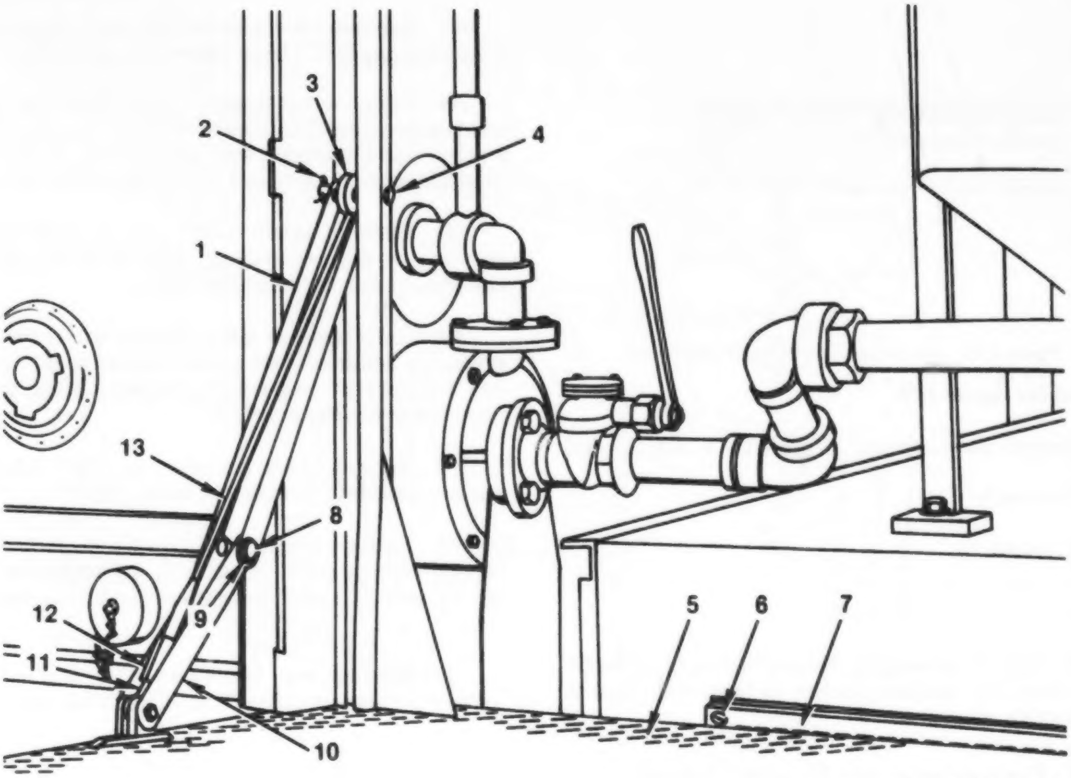


TS 4610-221-12/4-29

Figure 4-29. Lower Door, Inside, Removal

Legend for figure 4-29:

1. Screw, machine 1/4-20 x 3/4 in. (15)
2. Lower door
3. Van body



TS 4610-221-12/4-30

Figure 4-30. Counterbalance, Lower Left Door

Legend for figure 4-30:

1. Upper folding arm (2)
2. Pin, cotter, 1/8 x 1/2 in. (4)
3. Cable roller (2)
4. Pin, headed, 7/16 x 2 9/16 in. (2)
5. Lower left door
6. Machine screw (spec) (12)
7. Hinge
8. Rivet, 3/8 x 7/16 in (4)
9. Washer, flat, 5/16 in (4)
10. Lower folding arm (2)
11. Terminal (2)
12. Turnbuckle barrel (2)
13. Cable (2)

(10) Remove the other nut, washer, and screw (3) and remove upright arm (14) and spacer (13) from cable bar (9).

(11) Remove and disassemble the other left door counterbalance in a similar manner.

d. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of left door counterbalances with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect cable for cracked, broken, or frayed strands. Inspect turnbuckle barrel and terminal at ends of cable for cracks, breaks, distortion, and damaged screw threads. Replace a damaged or defective cable.

(3) Inspect cable roller for cracks or breaks and for scarred cable bearing surfaces that may cause premature wear of cable. Replace a damaged or defective cable roller.

(4) Inspect folding arms for distortion and cracks. Examine hinge action of folding arms for impaired or restricted movement. Replace damaged or defective folding arms.

(5) Inspect cable bar, upright arm, arm mounting angle, and guides for cracks, breaks, and distortion. Straighten minor distortions or replace any part if otherwise unserviceable.

Legend for figure 4-31:

1. Washer, flat, 5/16 in. (2)
2. Nut, hex, 5/16-18 (2)
3. Screw, machine, 5/16-18 x 1 in. (2)
4. Pin, straight-hd, 7/16 x 2 1/8 in. (2)
5. Gasket door
6. Roller (2)
7. Cable (2)
8. Screw, cap, hex, 1/4-20 x 3/4 in. (2)
9. Cable bar (2)
10. Van body
11. Guide (4)
12. Screw, machine, 1/4-20 x 5/8 (4)
13. Spacer (2)
14. Upright arm (2)
15. Washer, flat, 1/4 in. (2)
16. Nut, 1/4-20 (2)
17. Arm mounting angle (2)
18. Upper left door
19. Screw, tapping, 1/4-20 x 1/2 in (4)

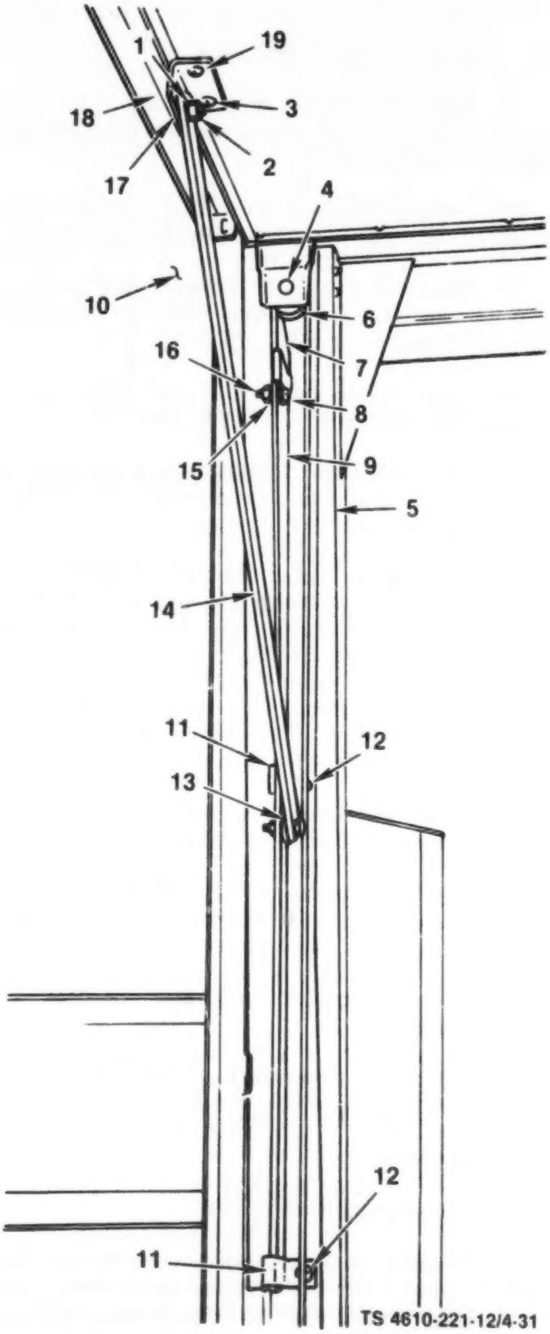


Figure 4-31. Counterbalance, Upper Left Door

e. Reassembly and Installation.

(1) Position upright arm (14, fig. 4-31) and spacer (13) on cable bar (9) and secure with screw (3), washer (1), and nut (2).

(2) Connect yoke end of cable (7) to cable bar (9) and secure with capscrew (8), washer (15), and nut (16).

(3) Place cable (7) over roller (6) and position roller on van body (10). Secure roller to van body with pin (4) and cotter pin.

(4) Position two guides (11) over cable bar (9) and secure to van body (10) with screws (12).

(5) Assemble upper folding arm (1, fig. 4-30) to lower folding arm (10) and secure with two washers (9) and rivets (8).

(6) Lead cable behind the cable roller (3) and assemble cable roller (3) and folding arms (1 and 10) on van body. Secure cable roller and folding arms with pin (4) and cotter pin (2).

(7) Attach terminal (11) to turnbuckle (12). Position lower folding arm (10) on lower left door (5) and secure with pin and washer.

(8) Install arm mounting angle (17, fig. 4-31) on upper left door (18) and secure with two screws (19).

(9) Connect upright arm (14) to arm mounting angle (17) and secure with screw (3), washer (1), and nut (2).

(10) Remove support from lower left door and upper left door.

(11) Adjust left doors so that they close together as described in paragraph b. above.

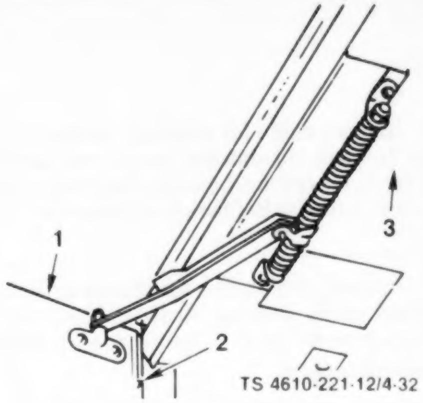
4-39. Rear Door.

a. Removal and Disassembly.

(1) Remove ventilating window (para 4-35), door handles (para 4-29) and latches (para 4-30), grab handle (para 4-32), and doorcheck and holdback (para 4-41).

(2) Remove 24 rivets (2, fig. 4-32) and remove rear door (1) from van body (3).

(3) Remove door hinge and seal in a similar manner to that described in paragraph 4-35.



TS 4610-221-12/4-32

Figure 4-32. Rear Door, Removal

Legend for figure 4-32:

1. Rear door
2. Rivet, 1/4 x 7/16 in. (24)
3. Van body

b. Cleaning, Inspection, and Repair.

WARNING

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Clean, inspect, and repair rear door hinge and seal in a manner similar to that described in paragraph 4-37.

c. Reassembly and Installation.

(1) Install door hinge and seal on rear door in a manner similar to that described in paragraph 4-37.

(2) Position rear door (1, fig. 4-32) to van body (3) and secure with 24 rivets (2).

(3) Install ventilating window, door handles, latches, grab handle, doorcheck, and holdback.

4-40. Right Side Door.

a. Removal and Disassembly.

(1) Remove stationary window, (para 4-32) door handles and latches, (para 4-29, 4-30) ladder holders and hangers, (para 4-43) and doorcheck and holdback, (para 4-41).

(2) Remove and disassembly right side door in a manner similar to that described in paragraph 4-39.

b. Cleaning, Inspection, and Repair. Clean, inspect, and repair right side door, door hinge, and seal in a manner similar to that described in paragraph 4-37.

c. Reassembly and Installation.

(1) Reassemble and install right side door in a manner similar to that described in paragraph 4-39.

(2) Install stationary window, door handles and latches, ladder holders and hangers, and doorcheck and holdback.

4-41. Right and Rear Doorcheck and Holdbacks.

a. General. The spring loaded doorcheck and holdbacks retain right side door and rear door in the open position.

b. Removal.

(1) Remove two screws (1, fig. 4-33) and separate bracket (15) from rear door (14).

(2) Remove two capscrews (7), nuts and lockwashers and remove doorcheck and holdback from ceiling of van body (13).

(3) Remove doorcheck and holdback from right side door in a similar manner.

c. Disassembly.

(1) Remove nut (3) and remove bracket (15) from swing rod slide (12).

(2) Remove cotter pin (5) that secures pin (4) and remove pin (4) separating swing rod slide (12) from swing rod bracket (6).

(3) Remove nut (9) from each end of slide rod (8) and remove two slide rod brackets (11), springs (10), and swing rod bracket (6) from slide rod.

(4) Disassemble the other doorcheck and holdback in a similar manner.

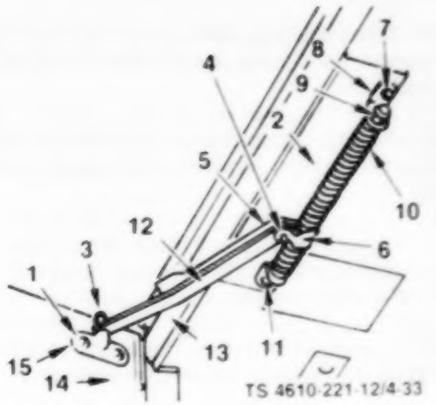


Figure 4-33. Doorcheck and Holdback, Removal

Legend for figure 4-33:

1. Screw, thd-forming, 1/4-20 x 1 1/4 in. (4)
2. Bracket
3. Nut, self-locking, 3/8-24 (2)
4. Pin, straight-hd, 0.248 x 51/64 in. (2)
5. Pin, cotter, 1/16 x 1/2 in. (2)
6. Swing rod bracket (2)
7. Screw, machine, 1/4-20 x 3/4 in. (4)
8. Slide rod (2)
9. Nut, self-locking, 3/8-24 (4)
10. Spring (4)
11. Slide rod bracket (4)
12. Swing rod slide (2)
13. Van body
14. Rear door
15. Bracket (2)

d. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of doorcheck and holdback with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect swing rod bracket, slide rod brackets, and bracket for cracks and breaks. Replace a damaged part.

(3) Inspect springs for cracked or distorted coils and for fatigue. Replace a damaged or defective spring.

(4) Inspect swing rod slide for a bent or distorted condition. Straighten minor bends or replace if otherwise serviceable.

(5) Inspect slide rod for distortion and damaged screw threads. Replace a damaged slide rod.

e. Reassembly.

(1) Install swing rod bracket (6, fig. 4-33) on slide rod (8) and, on either side of swing rod bracket, install a spring (10) and two slide brackets (11). Secure slide rod brackets (11) to slide rod with two nuts (9).

(2) Position swing rod slide (12) on swing rod bracket (6), aligning the pinholes in each. Insert pin (4) into aligned holes and secure pin with cotter pin (5).

(3) Install bracket (15) on swing rod slide (12) and secure with nut (3).

(4) Assemble the other doorcheck and holdback in a similar manner.

f. Installation.

(1) Position doorcheck and holdback on ceiling of van body (13) and secure with lockwashers, nuts, and capscrews (7).

(2) Position bracket (15) on rear door (14) and secure with two lockwashers (16) and screws (1).

(3) Install door check and holdback on right side door in a similar manner.

4-42. Bonnet Doors.

a. Removal and Disassembly.

(1) Disconnect electrical cables from clearance lights and remove cable. Remove door fasteners from bonnet doors.

(2) Remove rivets (3, fig. 4-34) and remove bonnet door (4) from bonnet of van body (1).

(3) Remove rivets (2) and remove door hinge (5) from bonnet door (4).

(4) Remove door seals from bonnet door in a similar manner to that described in paragraph 4-37.

(5) Remove and disassemble the other bonnet door in a similar manner.

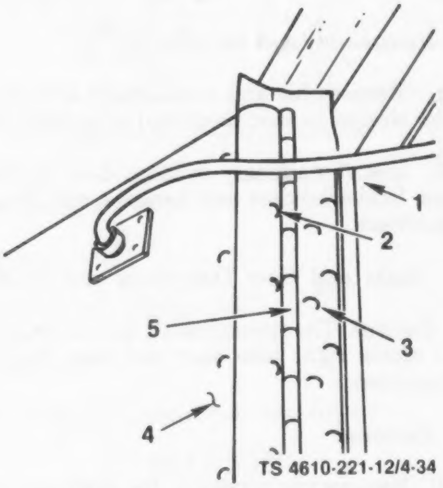


Figure 4-34. Bonnet Door, Removal

Legend for figure 4-34:

1. Van body
2. Rivet, 3/16 x 5/16 in. (9)
3. Rivet, 3/16 x 5/16 in. (6)
4. Bonnet door
5. Door hinge

b. Cleaning, Inspection and Repair. Clean, inspect, and repair bonnet doors, hinges, and seal in a similar manner to that described in paragraph 4-37.

c. Reassembly and Installation.

(1) Install door seals on the bonnet door in a similar manner to that described in paragraph 4-37.

(2) Install door hinge (5) on bonnet door (4) and secure with rivets (2).

(3) Position bonnet door (4) to van body (1) and secure with rivets (3).

(4) Reassemble and install other bonnet door in a similar manner.

(5) Install door fasteners on bonnet doors.

4-43. Ladder Holders and Hangers.

a. General. The ladder holders and hangers are mounted on the inside of right side door and secure right side entrance ladder to door when not in use.

b. Removal.

(1) Remove four screws (3, fig. 4-21) and remove two ladder hangers (4) from right side door (10).

(2) Remove wingnut (15) and remove clamp (14) from ladder bracket (13).

(3) Remove other four screws (3) and remove ladder bracket (13) from right side door (10).

(4) Remove screw (11) that secures each rubber bumper (12) to ladder bracket (13) and remove two rubber bumpers.

c. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean ladder holder and hangers with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect hangers and ladder holder for distortion. Straighten minor bends and distortions.

(3) Inspect wingnut and ladder bracket for cracks, breaks, damaged threads, and distortion. Straighten minor bends and distortions and replace if otherwise unserviceable.

(4) Inspect rubber bumpers for deterioration. Replace damaged or deteriorated rubber bumpers.

d. Installation.

(1) Install two rubber bumpers (12, fig. 4-21) on ladder bracket (13) and secure with screws (11).

(2) Position ladder bracket (13) on the inside of right side door (10) and secure with four screws (3).

(3) Install clamp (14) on ladder bracket (13) and loosely secure with wingnut (15).

(4) Position two ladder hangers (4) on the inside of right side door (10) and secure each ladder hanger with two screws (3).

4-44. Roof Hatch.

a. General. The roof hatch is located above erdlator tank and may be opened during fair weather to facilitate ventilation and give light.

b. Removal and Disassembly.

(1) Turn four handle nuts (1, fig. 4-35) counterclockwise and move hatch clips (2) away from van body. Remove roof hatch (3) from van body (7).

(2) Remove four handle nuts (1), washers (4), and hatch clips (2) from reinforcing plate assemblies.

(3) Remove four screws (5) that secure each reinforcing plate assembly (6) and remove four reinforcing plate assemblies (6) from roof hatch (3).

(4) Remove rivets that hold rubber seals around edge of roof hatch and remove rubber seals.

c. Cleaning, Inspection, and Repair.

WARNING

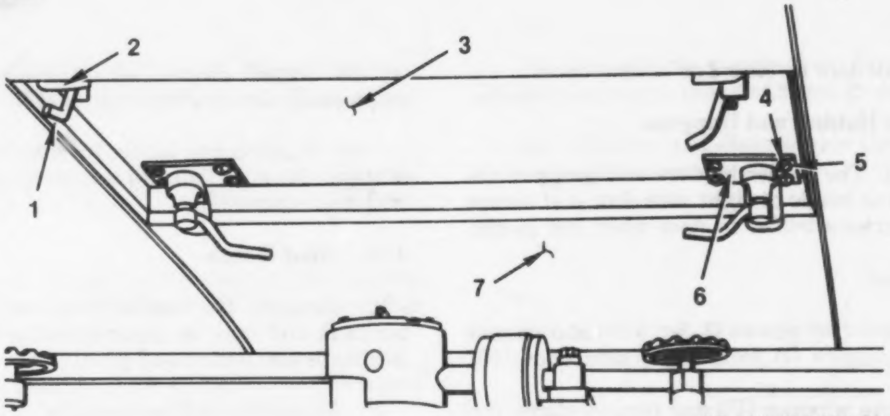
Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean roof hatch and all parts with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect reinforcing plate assemblies for cracks, breaks, and damaged screw threads. Replace a defective reinforcing plate assembly.

(3) Inspect handle and hatch clips for cracks and breaks. Replace a defective part.

(4) Inspect roof hatch for dents, distortions, and punctures. Replace a damaged or defective roof hatch.



TS 4610-221-12/4-35

Figure 4-35. Roof Hatch, Removal

Legend for figure 4-35:

1. Handle nut (4)
2. Hatch clip (4)
3. Roof hatch
4. Washer, lock, 1/4 in. (4)
5. Screw, wood, 1/4-20 x 3/4 in. (16)
6. Reinforcing plate assembly (4)
7. Van body

d. *Reassembly and Installation.*

(1) Insert lip of the seals in groove provided around edge of roof hatch (3, fig. 4-35) and rivet seals in place.

(2) Install four reinforcing plate assemblies (6) on each corner of roof hatch (3) and secure with 16 screws (5).

(3) Loosely install four hatch clips (2), washers (4), and handle nuts (1) on reinforcing plate assemblies (6).

(4) Install roof hatch (3) on van body (7) and secure by positioning hatch clips (2) over edge of van body and tightening handle nuts (1) to clamp hatch clips.

Section XII. MAINTENANCE OF MISCELLANEOUS BODY, CHASSIS, OR HULL AND ACCESSORY ITEMS

4-45. Reflectors.

a. General. The eight reflectors on the van body consist of four red ones mounted on rear and four amber ones mounted on front.

b. Removal. Remove two screws (3), fig. 3-5) and washers (2) and remove reflector (1) from van body.

c. Replacement. Replace damaged reflectors.

d. Installation. Position reflector (1) on van body and secure with two screws (3) and washers (2).

4-46. Personnel Heater

For organizational maintenance of personnel heater, refer to TM 5-4520-227-14.

Section XIII. MAINTENANCE OF ELECTRIC MOTORS

4-47. Erdlator Agitator Motor.

a. General. The erdlator motor assembly is mounted on adjustable agitator motor base, located on bridge rails of erdlator tank. The erdlator motor assembly is a 1/2 horsepower squirrel cage, inductor-type 110/208 volt, 60 Hz, 3-phase motor.

b. Removal.

(1) Remove four screws (13, fig. 4-36), junction box cover (12), and gasket (11) from motor assembly (7).

(2) Remove three wire nuts (14) and separate three electrical leads of cable (1) from motor electrical leads.

(3) Loosen cable connector nut (2) and remove cable (1), with attached connector nut, from motor assembly.

(4) Remove grommet (4), seal (3), and cable connector nut (2) from cable.

(5) Remove cable connector (6) from motor assembly (7).

(6) Turn handwheel (9, fig. 4-37) clockwise to release tension on V-belt (5) and remove V-belt from pulley (6).

(7) Remove four nuts, lockwashers, capscrews (7), and eight flat washers (8) and remove motor assembly (12) from agitator motor base (11).

c. Disassembly. Remove setscrew (10, fig. 4-36), pulley (9), and machine key (8) from drive shaft of motor assembly (7).

d. Cleaning, Inspection, and Replacement.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean motor assembly, pulley, and junction box cover with cleaning solvent (item 1, App. E) and dry thoroughly. Wipe the cable with a clean, dry cloth.

(2) Inspect cable, connector cover, and grommet for cracks, breaks, corrosion, and deterioration. Replace a defective cable, connector cover, or grommet.

(3) Inspect motor assembly for evidence of being burned and for a bound or restricted drive shaft. Replace a defective motor assembly.

e. Reassembly. Install machine key (8, fig. 4-36) in the drive shaft of the motor assembly, slide pulley (9) over the drive shaft, locating it on the machine key, and secure with setscrew (10).

f. Installation.

(1) Position motor assembly (12, fig. 4-37) on agitator motor base (11) and secure with four nuts, lockwashers, capscrews (7) and eight flat washers (8).

(2) Install V-belt (5) in third groove from end of pulley (6) and turn handwheel (9) counterclockwise to create tension on the V-belt.

(3) Install cable connector (6, fig. 4-36) in motor assembly (7).

(4) Insert four electrical leads of cable (1) through cable connector nut (2), seal (3), and grommet (4).

(5) Thread four electrical leads of cable through cable connector (6) and into junction box of motor assembly. Pull cable connector nut down cable and screw it onto cable connector (6).

(6) Join three electrical leads of cable (1) to electrical leads of motor assembly (7) and secure with wire nuts (14). Bind wire nuts in place with electrical tape.

NOTE

Alternating current creates a vibration between electrical connections. If electrical connections are not securely bound together, failure due to loose connections may result during operation.

(7) Install gasket (11) and junction box cover (12) on motor assembly (7) and secure with four screws (13).

4-48. Slurry Feeder Motor.

a. General. The 1/4 horsepower, squirrel-cage, induction-type 208 volt, 60 Hz, 3-phase electric motor is mounted below slurry feeder assembly.

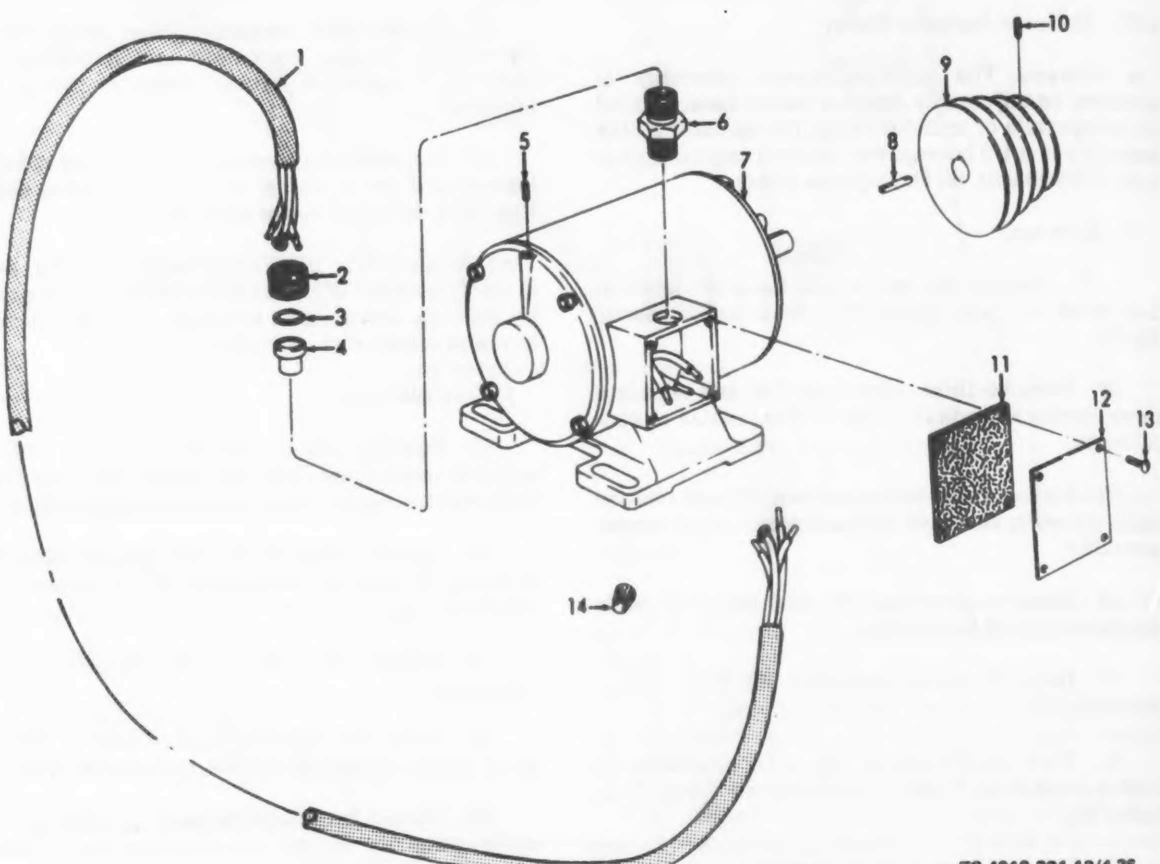


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Figure 4-36. Erdlator Agitator Motor Assembly, Partially Exploded View

Legend for figure 4-36:

1. Cable
2. Connector nut
3. Seal
4. Grommet
5. Plug, oil, 1/4-20 x 1/4 in. (2)
6. Cable connector
7. Motor assembly
8. Key, machine, square, 1/8 x 1 1/8 in.
9. Pulley
10. Setscrew, 5/16-18 x 1/2 in.
11. Gasket
12. Junction box cover
13. Screw, machine, No 8-32 x 3/8 in. (4)
14. Wire nut (3)

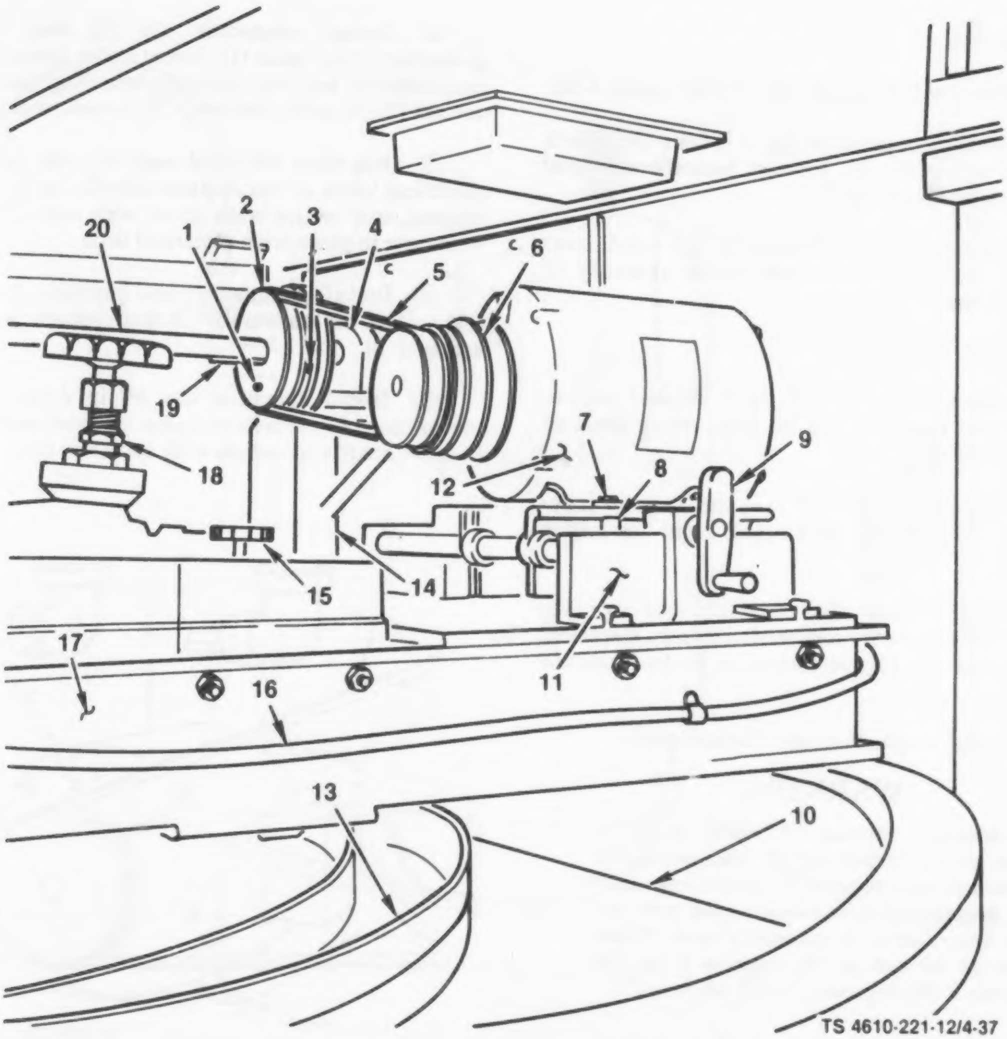

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Figure 4-37. Erdlator Agitator Motor Assembly, Removal

Legend for figure 4-37:

1. Setscrew, 1/4-20 x 3/8 in. (2)
2. Pulley, 4 in.
3. Setscrew, 5/16-18 x 1 1/2 in. (4)
4. Bearing unit (2)
5. V-belt
6. Pulley
7. Screw, cap 3/8-16 x 1 1/2 in. (4)
8. Washer, flat, 3/8 in. (8)
9. Handwheel
10. Erdlator tank
11. Agitator motor base
12. Motor assembly
13. Effluent launder
14. Bracket (2)
15. Effluent launder leveling rod (3)
16. Electrical cable
17. Bridge rail
18. Control valve (CV-11)
19. Collar (2)
20. Erdlator drive shaft

b. Removal

(1) Remove belt guard and V-belt (para 4-50).

(2) Disconnect cable (6, fig. 3-8) from twist-lock receptacle connector (1), located beneath chemical solution feeder assembly (2).

(3) Remove four capscrews (6, fig. 4-38), lockwashers (5), and nuts and remove motor assembly (2) from slurry feeder frame (4).

c. Disassembly.

(1) Remove setscrew (10, fig. 4-39) and remove pulley (9) and machine key (8) from drive shaft of motor assembly (7).

(2) Remove four screws (13) and remove junction box cover (12) and gasket (11) from the motor assembly.

(3) Remove three wire nuts (15) and separate electrical leads of motor assembly (7) from electrical leads of cable (1). Tag electrical leads to facilitate assembly.

d. Cleaning, Inspection, and Replacement.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean motor assembly, pulley, and junction box cover with cleaning solvent (item 1, App. E) and dry thoroughly. Wipe cable with a clean, dry cloth.

(2) Inspect cable, connector cover, and grommet for cracks, breaks, corrosion, and deterioration. Replace a defective cable, connector cover, or grommet.

(3) Inspect motor assembly for evidence of being burned and for a bound or restricted drive shaft. Replace a defective motor assembly.

e. Reassembly.

(1) Install cable connector (6, fig. 4-39) in motor assembly (7).

(2) Install connector nut (2), seal (3), and grommet (4) on cable (1). Insert cable through cable connector (6) and into junction box. Tighten connector nut (2) on cable connector (6) to secure cable.

(3) Join three electrical leads of cable (1) to three electrical leads of motor assembly (7), as previously tagged, and secure with three wire nuts (14). Bind wire nuts in place with electrical tape.

(4) Install gasket (11) and junction box cover (12) on motor assembly (7) and secure with four screws (13).

(5) Install machine key (8) in drive shaft of motor assembly. Position pulley (9) over machine key in drive shaft and secure with setscrew (10).

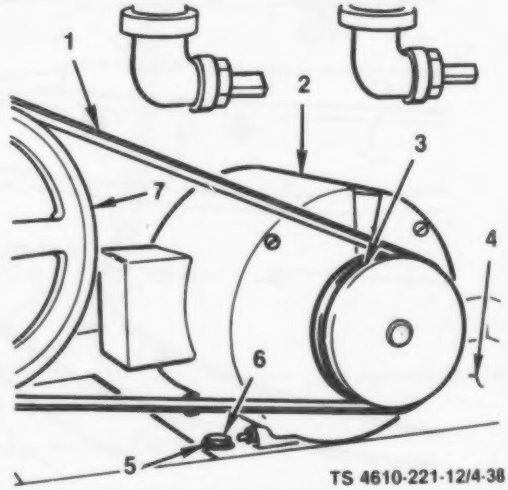

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Figure 4-38. Slurry Feeder Motor Assembly, Removal

Legend for figure 4-38:

1. V-belt
2. Motor assembly
3. Motor pulley
4. Slurry feeder frame
5. Washer, lock, 5/16 in. (4)
6. Screw, cap, 5/16-18 x 1 in. (4)
7. Gear assembly pulley

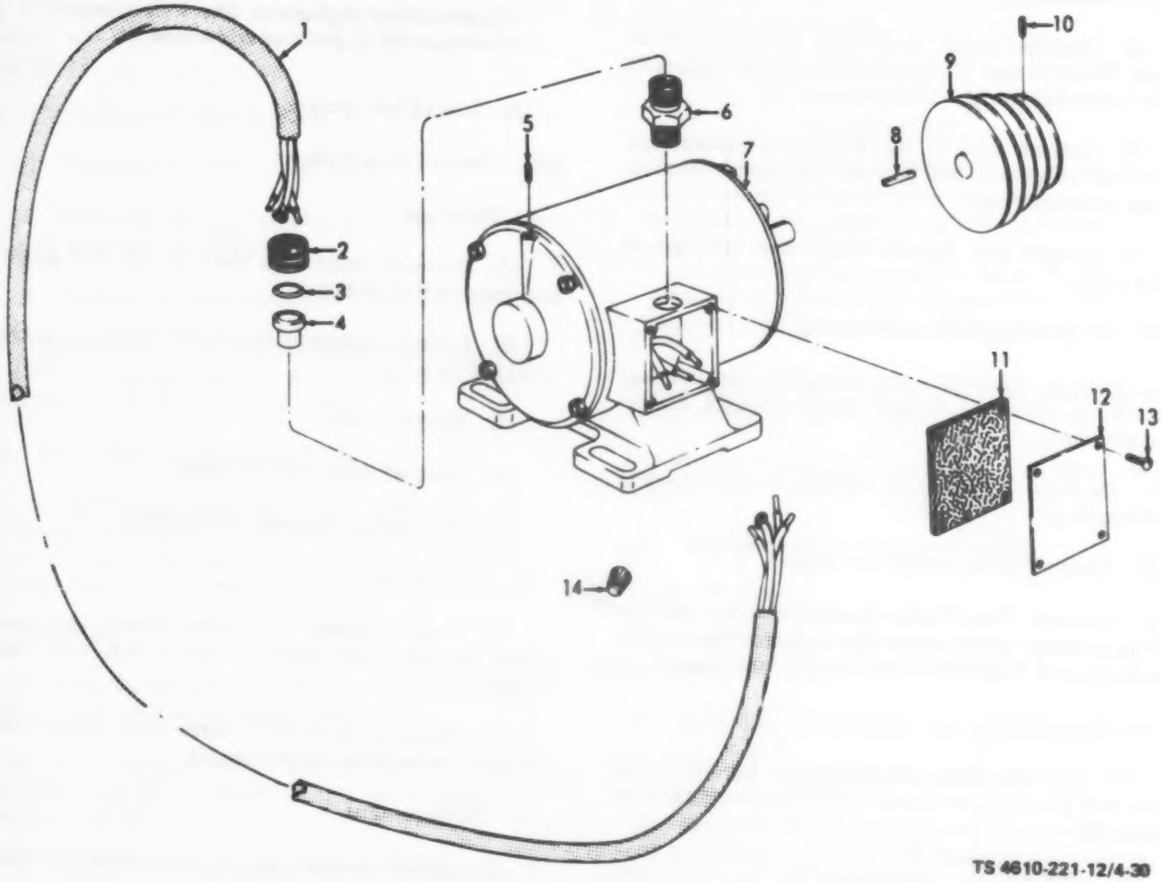

Figure 4-39. Slurry Feeder Motor Assembly, Partially Exploded View

Legend for figure 4-39:

1. Cable
2. Cable connector nut
3. Gasket
4. Grommet
5. Junction box
6. Cable connector
7. Motor assembly
8. Key, machine, square 3/16 x 1 3/8 in.
9. Pulley
10. Setscrew, hex-socket, flat-point, 1/4-20 x 1/2 in.
11. Gasket
12. Junction box cover
13. Screw, machine, No. 8-32 x 3/8 in. (4)
14. Wire nut (spec) (3)

f. Installation.

(1) Position motor assembly (2, fig. 4-38) on slurry feeder frame (4) and loosely secure with four nuts, lockwashers (5), and capscrews (6).

(2) Connect cable (6, fig. 3-8) into receptacle box terminal strip, located beneath chemical solution feeder assembly (2).

(3) Install and adjust V-belt and belt guard (para 4-50).

4-49. Frame Supports and Housing.

a. Inspect. Inspect frame supports and housing for cracks, breaks, damaged screw threads, distortion and wear.

b. Replace. If damaged, replace frame supports and housings.

4-50. Slurry Feeder Motor Drivebelt.

a. General. The V-belt transmits rotary motion of slurryfeeder motor assembly to slurry feeder gear assembly and is protected by a metal belt guard.

b. Removal.

(1) Remove three capscrews (9, fig. 2-23) and nuts and remove belt guard (10) from slurry feeder frame (8).

(2) Loosen four capscrews (6, fig. 4-38) and move motor assembly (2) to the left.

(3) Remove V-belt (1) from motor pulley (3) and gear assembly pully (7).

c. Inspect and Replace.

(1) Inspect belt for cracks, tears, or general wear.

(2) Replace a worn V-belt.

d. Installation.

(1) Install V-belt (1, fig. 4-38) on motor pulley (3) and gear assembly pulley (7).

(2) Move motor assembly (2) to the right, away from gear assembly, until V-belt can be depressed approximately 1 inch midway between two pulleys. Tighten four capscrews (6) to secure motor assembly.

NOTE

Check pulley alignment. The V-belt must run squarely in grooves of pulleys.

(3) Install belt guard.

4-51. Motor Drive Pulleys.

a. Removal

(1) Remove capscrews that secure belt guard and remove blet guard.

(2) Loosen capscrews and move motor assembly until belt is loose.

(3) Remove belt.

(4) Remove setscrew on pulley.

(5) Remove pulley and machine key.

b. Inspection.

(1) Inspect pulley for cracks, breaks, damaged screw threads, and nicks or burrs that may tear V-belt.

(2) Remove nicks and burrs from pulley and replace if otherwise unserviceable.

c. Replacement.

(1) Install machine key in drive shaft of motor assembly.

(2) Slide pulley over drive shaft, locating it on machine key.

(3) Secure with setscrew.

(4) Move motor assembly until belt is tight and tighten capscrews.

(5) Install belt guard.

4-52. Magnetic Motor Starter Overload Relay Heater.

a. Location and Purpose. An overload relay, with a relay heater, is mounted to each side of each magnetic motor starter. The overload relay heaters prevent damage to equipment in case of overload in circuit.

All overlaod relay heaters are removed and replaced in the same manner.

b. Removal. Remove two mounting screws (6, fig. 4-40) from overload relay heater (7) and pull straight out on heater to remove it from overload relay (5).

c. Clean, Inspect, and Replace.

(1) Clean heater with a clean cloth.

(2) Inspect heater for cracks, burned or broken wires, or damaged insulation.

(3) Replace an unserviceable overload heater.

d. Installation. Position overload relay heater (7, fig. 4-40) in overload relay (5), and secure it with two mounting screws (6) and lockwasher.

4-53. Motor Starter Operating Coil.

a. Location. The magnetic starter operating coils are located on magnetic starters between overload relays. When current flows through coil it creates a magnetic field and causes motor starter to engage.

b. Removal.

(1) Remove terminal screws (1, fig. 4-40) from operating coil retainer (2) which holds wires.

(2) Press against coil (4) and at the same time pull slightly on coil retainer (2) and move retainers away from coil (4).

(3) Pull one end of spring clip (3) forward and slide it out of slot.

(4) Draw movable portion of magnet assembly (8) and coil (4) from starter.

c. Clean, Inspect, and Replace.

WARNING

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(1) Clean coil with a clean cloth dampened with cleaning solvent (item 1, App E).

(2) Inspect coil for cracks and damaged terminals.

(3) Replace coil if it is unserviceable.

d. Installation.

(1) Position coil (4, fig. 4-40) on magnet assembly (8).

(2) Position coil magnet assembly in starter.

(3) Replace spring clip (3) in slot.

(4) Position wires on terminal screws (1) and insert them into operating coil retainer and tighten them.

Section XIV. MAINTENANCE OF ELECTRICAL EQUIPMENT

4-54. Circuit Breaker.

a. General. The circuit breaker, located in lower portion of control cabinet, controls van body electrical system.

b. Removal

(1) Open control cabinet door.

(2) Remove four terminal screws (2, fig. 4-41) and tag and disconnect four electrical leads (4) from circuit breaker (3).

(3) Remove two screws (1) and remove circuit breaker from control cabinet.

c. Testing. Test continuity through circuit breaker using a multimeter set at lowest ohm scale. The multimeter must show continuity when circuit breaker is in ON position and no continuity when in OFF position.

d. Cleaning and Inspection.

(1) Clean circuit breaker with a clean, dry cloth.

(2) Inspect circuit breaker for a cracked or broken plastic body and defective mechanical operation. Replace a damaged or defective circuit breaker.

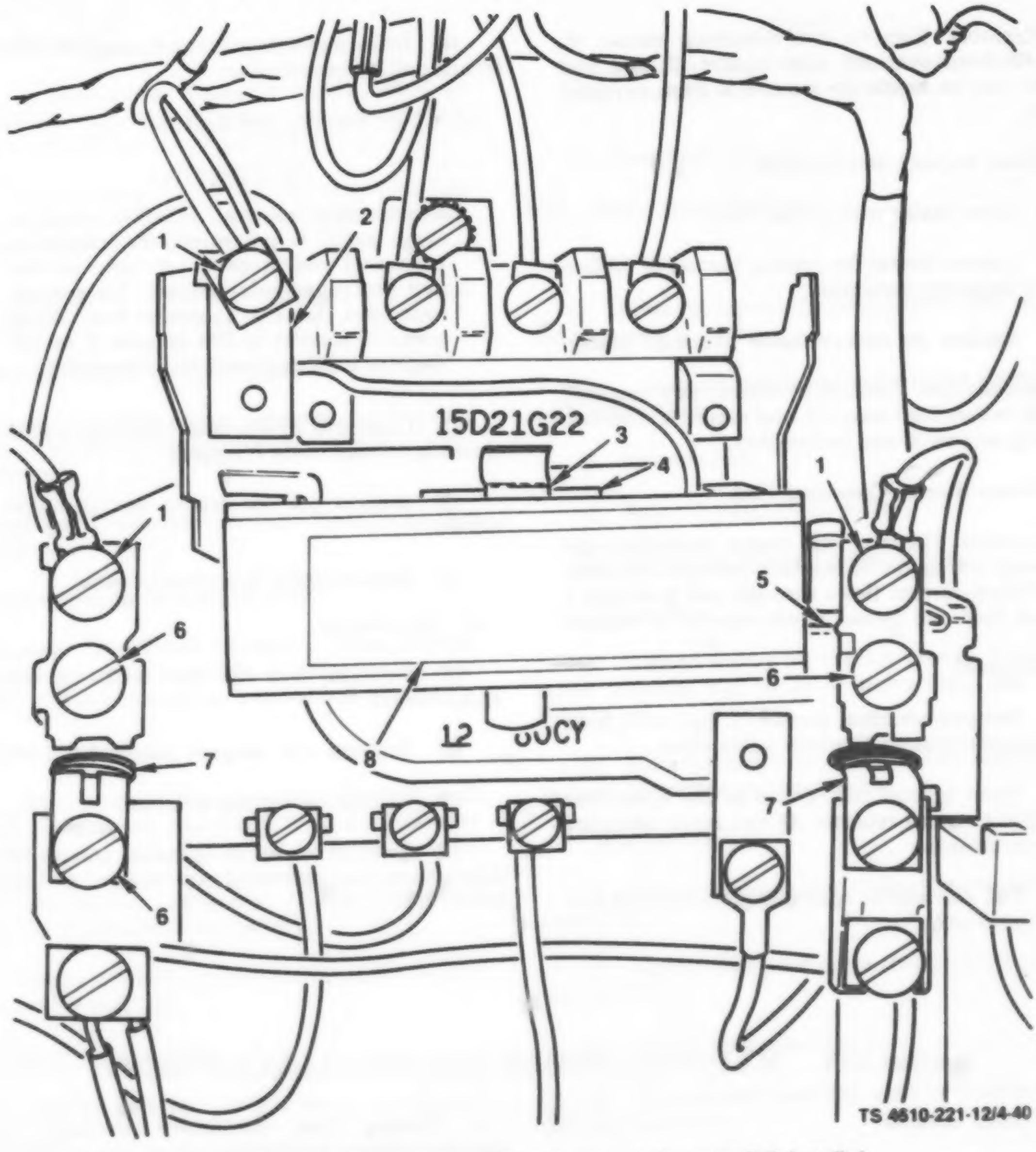
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Figure 4-40. Motor Starter Overload Relay heater and Operating Coil, Installed

Legend for figure 4-40:

1. Terminal screw
2. Operating coil retainer
3. Spring clip
4. Operating coil
5. Overload relay
6. Relay heater mounting screw w/lockwasher (2)
7. Overload relay heater
8. Magnet assembly

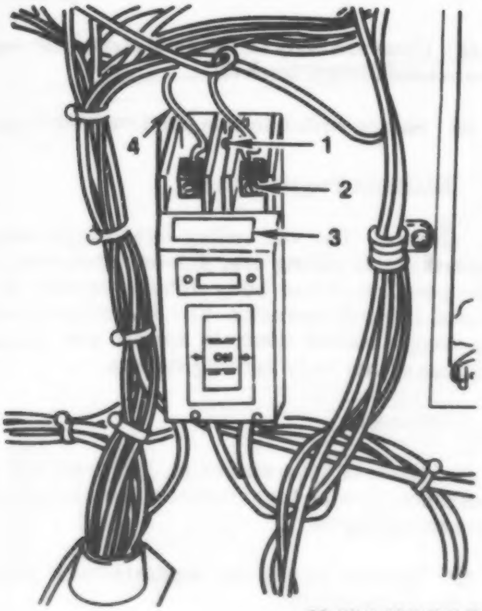

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Figure 4-41. Circuit Breaker, Removal

Legend for figure 4-41:

1. Screw
2. Terminal screw (4)
3. Circuit breaker
4. Electrical lead (4)

e. *Installation.*

(1) Install circuit breaker (3, fig. 4-41) in control cabinet and secure with two screws (1).

(2) Connect four electrical leads (4) to circuit breaker (3), as previously tagged, and secure with four screws (2).

(3) Close control cabinet door.

4-55. Blackout Door Switches (All Units Except 816-1083).

a. *General.* The blackout switches are mounted on side and rear door posts and are actuated by the doors. Each switch controls both 110 volt and 24 volt circuit. When a door is opened, the blackout switch turns corresponding light circuit off when van ceiling lights toggle switch is in blackout position.

b. *Removal.*

(1) Remove cover (2, fig. 4-42) from case.

(2) Unscrew locknut (5) and remove switch (4) from case.

(3) Remove tape that covers terminals of switch.

(4) Remove terminal screws and mark and remove electrical leads.

c. *Replacement.* Replace a defective switch.

d. *Installation.*

(1) Attach electrical leads to terminals of switch. Cover with electrical tape.

(2) Close door. Insert switch into case and adjust switch to extend toward latch (3, fig. 4-43).

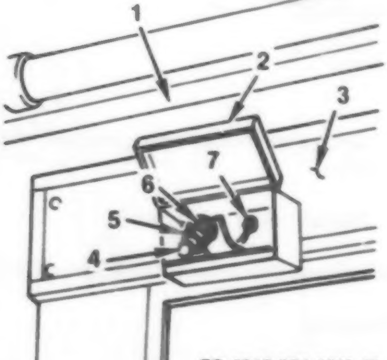

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Figure 4-42. Blackout, switch, Removal
(All Units Except 816-1083)

Legend for figure 4-42:

1. Cable
2. Cover
3. Van body
4. Switch
5. Locknut
6. Washer
7. Terminal screw

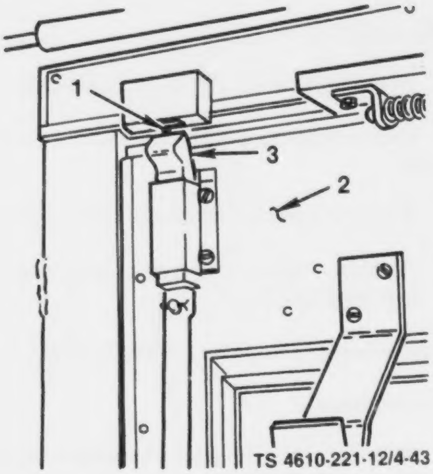

Figure 4-43. Blackout Switch, Adjustment (All Units Except 816-1083)

Legend for figure 4-43:

1. Switch
2. Van door
3. Latch

(3) Secure switch in this position with locknut (5, fig. 4-42).

(4) Install cover onto case.

4-56. Blackout Door Switches (Units 816-1083).

a. Removal.

(1) Remove screws (5, fig. 4-44) and cover (6) from case (1).

(2) Remove tape that covers the terminals of switch (3).

(3) Remove terminal screws (2) and mark and remove electrical leads.

b. Replacement. Replace a defective switch.

c. Installation.

(1) Attach electrical leads to terminals of switch (3, fig. 4-44), secure with terminal screws (2), then with electrical tape.

(2) Align gasket (4) and position cover (6).

(3) Replace screws (5) and tighten.

(4) Close van body (2, fig. 4-45) and adjust switch (1) to extend toward latch (3).

(5) Secure switch in this position with locknut.

4-57. Blackout Toggle Switch.

a. General. The van ceiling light toggle switch, mounted in van ceiling near side entrance door, controls operation of van body lighting system for 24 volt and 110 volt operation. The 3-positioned ceiling light toggle switch controls normal and blackout operation of van body lighting system.

b. Removal.

(1) Remove four screws (4, fig. 4-46) and pull cover plate (1), with toggle switch (5) attached, away from van ceiling (3).

(2) Remove nut (6) and separate cover plate (1) from toggle switch (5).

(3) Remove screws (8) and tag and disconnect electrical leads (7) from toggle switch (5).

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean toggle switch and cover plate with cleaning solvent (item 1, App. E) and dry thoroughly. Clean corrosion from switch terminals.

(2) Inspect switch for cracks, breaks, damaged screw threads, and improper operation. Replace a damaged toggle switch.

(3) Inspect cover plate for damage or distortion. Replace a defective cover plate.

d. Installation.

(1) Connect electrical leads (7, fig. 4-46) to terminals at toggle switch (5), as previously tagged, and secure with screws.

(2) Position cover plate (1) on toggle switch (5) and secure with nut (6).

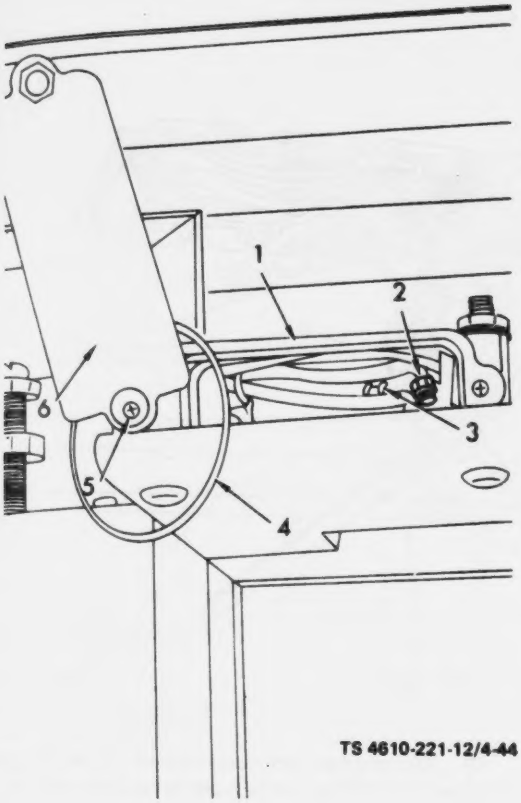

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Figure 4-44. Blackout Switch, Removal (Unit Serial Numbers 816-1083)

Legend for figure 4-44:

1. Case
2. Screw, terminal (2)
3. Switch
4. Gasket
5. Screw (2)
6. Switch cover

(3) Position cover plate, with toggle switch installed, against van ceiling (3) and secure with four screws (4).

4-58. Low Water Level Sensitive Switch.

a. General. The low water level sensitive switch is mounted on the rim of erdlator tank. It is a single-pole, spring-loaded, plunger-type microswitch that is normally open. The low water level sensitive switch is actuated when a low water condition exists in wet well tank. The switch turns indicator light on and, if the buzzer switch is in ON position, actuates the buzzer.

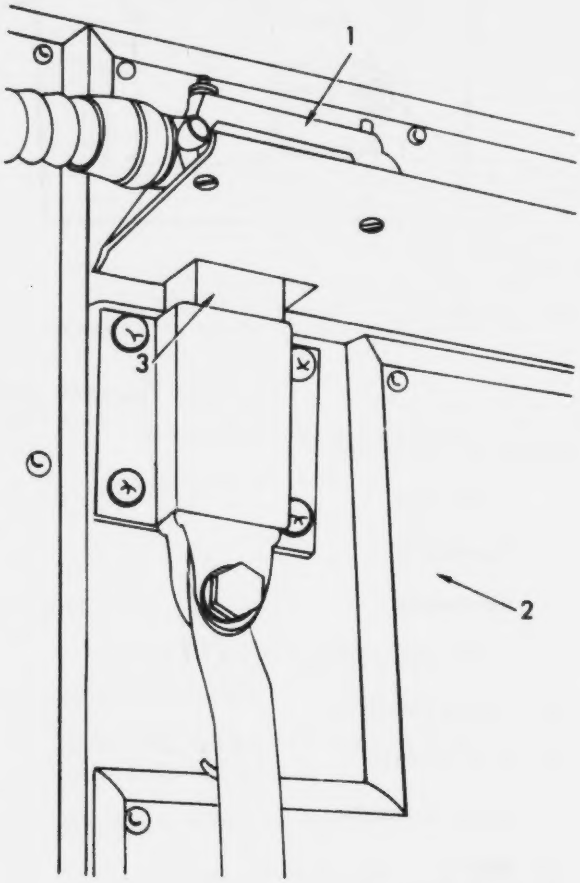

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Figure 4-45. Blackout switch, Installed (Units Serial Numbers 816-1083)

Legend for figure 4-45:

1. Switch
2. Van door
3. Latch

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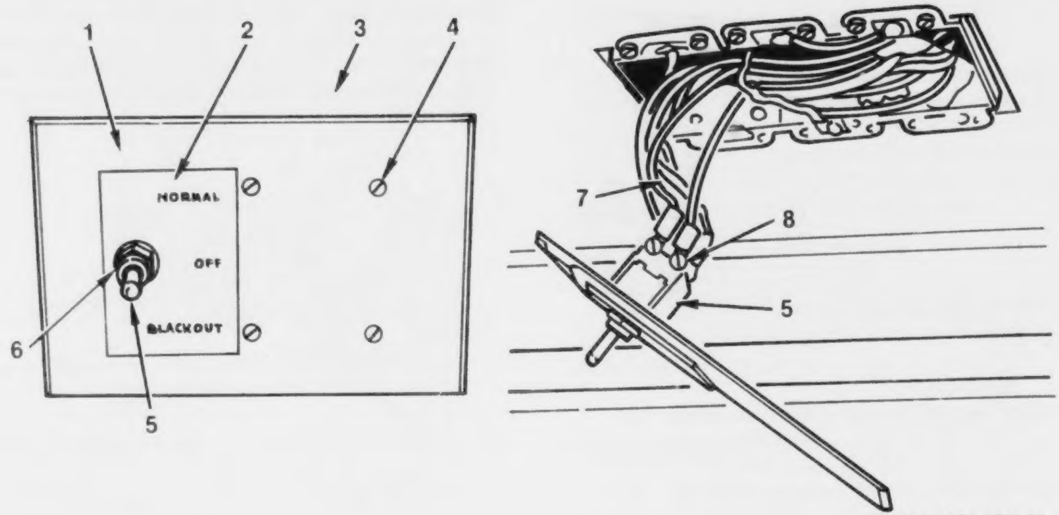


TS 4610-221-12/4-46

Figure 4-46. Blackout Light Toggle Switch

Legend for figure 4-46:

1. Cover plate
2. Nameplate
3. Van ceiling
4. Screw, self-tapping, No. 8 x 1/2 in. (4)
5. Toggle switch (1)
6. Nut (spec) (1)
7. Electrical leads
8. Screw

b. *Removal.*

(1) Remove two nuts, screws (12, fig. 4-47) and lockwashers (11) and remove sensitive switch (8) from mounting bracket (9).

(2) Remove two nuts, lockwashers, and capscrews (10) and remove mounting bracket (9) from erdlator tank (13).

(3) Remove two screws (4, fig. 4-48) and remove cover plate (1) from bottom of sensitive switch (3).

(4) Remove two terminal screws (2) and tag and disconnect electrical leads from sensitive switch.

(5) Screw connector nut (6) from connector (5) and pull cable (7) out of sensitive switch (3).

(6) Remove connector (5) from sensitive switch.

c. *Replacement.* Replace a defective switch.

d. *Installation.*

(1) Install connector (5, fig. 4-48) in sensitive switch (3).

(2) Thread cable (7) into sensitive switch and install connector nut (6) on the connector to secure electrical lead.

(3) Connect tagged cable to senstive switch and secure with two screws (2).

(4) Position cover plate (1) over the bottom of sensitive switch (3) and secure with two screws (4).

(5) Position mounting bracket (9, fig. 4-47) on erdlator tank (13) and secure with two nuts, lockwashers, and capscrews (10).

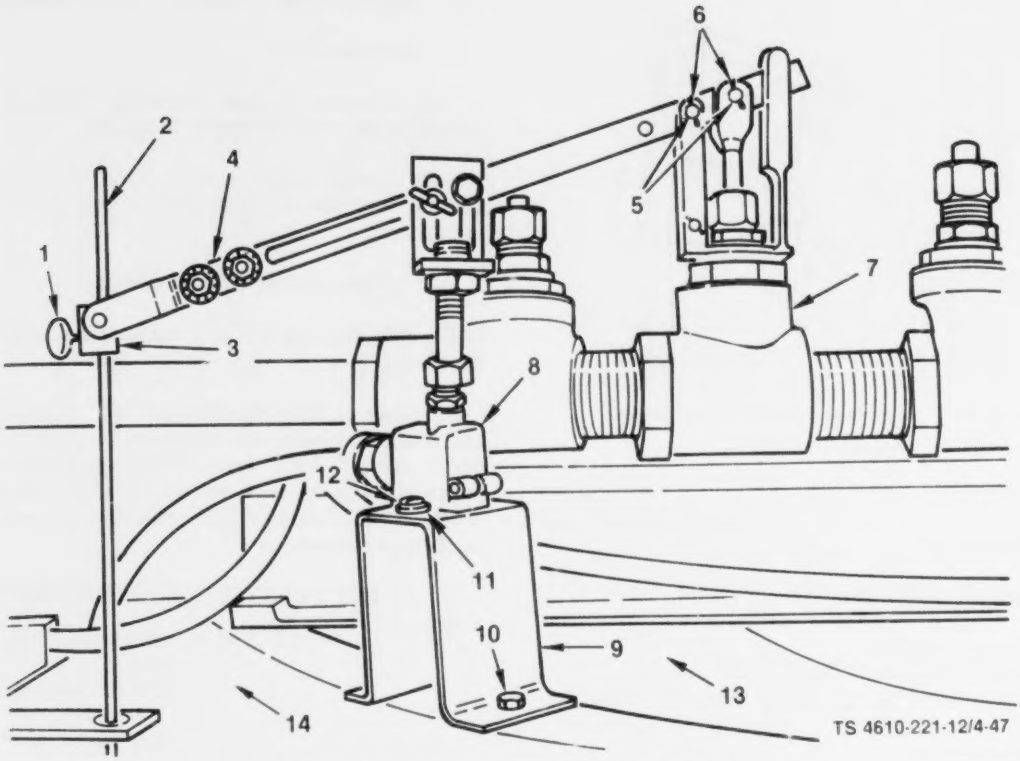


Figure 4-47. Low Water Level Sensitive Switch

Legend for figure 4-47:

1. Thumbscrew, 1/4-20 x 1/2 in.
2. Float rod
3. Float rod connector
4. Low water level alarm assembly
5. Lever pin (2)
6. Pin, cotter, 1/16 x 1/2 in. (4)
7. Float valve
8. Sensitive switch
9. Mounting bracket
10. Screw, cap, hex-hd 5/16-18 x 1 in. with lockwasher and nuts (2)
11. Washer, lock, ET, No. 8 (2)
12. Screw, machine, No. 8-36 x 5/8 in. (2)
13. Erdlator tank
14. Wet well tank

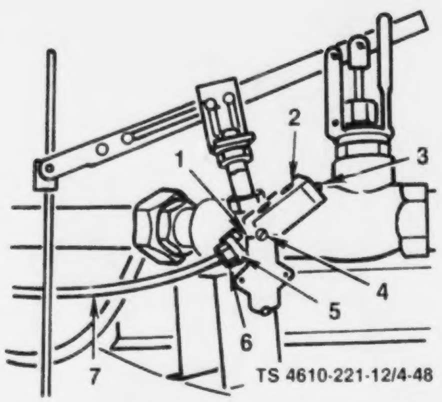


Figure 4-48. Low Water Level Sensitive Switch, Partially Removed

Legend for figure 4-48:

1. Cover Plate
2. Terminal screw (2)
3. Sensitive switch
4. Screw, machine, No. 8-32 x 1/4 in. (2)
5. Connector
6. Connector nuts
7. Cable

(6) Install sensitive switch (8) on mounting bracket (9) and secure with two screws (12), nuts, and lockwashers (11).

4-59. Warning Buzzer Alarm Toggle Switch.

a. General. The warning buzzer toggle switch is located on upper left-hand side of the control cabinet. When the switch is in ON position, the circuit is completed so low water level warning buzzer will sound when low water level sensitive switch is actuated.

b. Removal.

(1) Open control cabinet door.

(2) Remove nut (2, fig. 4-49) and instruction plate (4) and remove toggle switch (3) from inside control cabinet (1).

(3) Unsolder, tag, and disconnect electrical leads from toggle switch and remove toggle switch.

c. Replacement. Replace a defective switch.

d. Installation.

(1) Connect tagged electrical leads to toggle switch terminals and solder to secure.

(2) Install toggle switch (3) inside control cabinet (1) and secure with instruction plate (4) and nut (2).

(3) Close control cabinet door.

4-60. START and STOP Pushbuttons and Contact Blocks.

a. General. The START and STOP pushbuttons and contact blocks are mounted in control cabinet door. All START and STOP pushbuttons are momentary push type except for chemical solution feeder START and STOP pushbutton which is a latch type button.

b. START and STOP Pushbuttons and Contact Blocks.

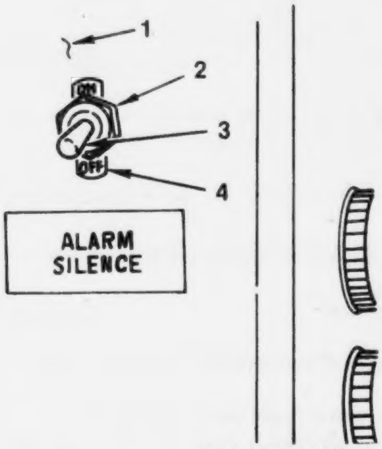


Figure 4-49. Warning Buzzer Toggle Switch

Legend for figure 4-49:

1. Control cabinet
2. Nut (spec)
3. Toggle switch
4. Instruction plate

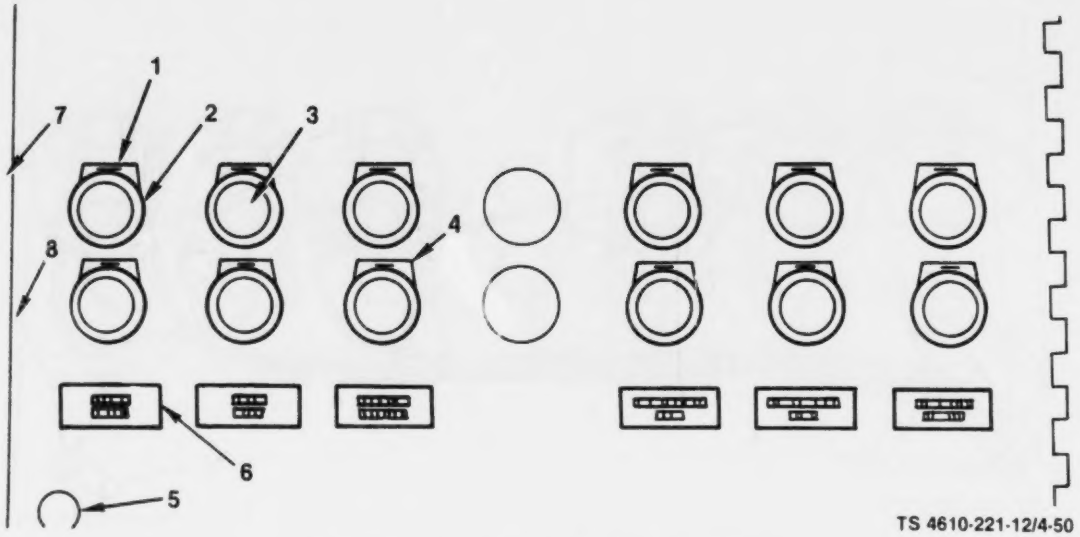


Figure 4-50. START and STOP Pushbuttons, Removal

Legend for figure 4-50:

1. Instruction plate (START) (6)
2. Knurled nut (12)
3. Pushbutton (12)
4. Instruction plate (STOP) (6)
5. Door handle (2)
6. Identification label
7. Control cabinet.
8. Control cabinet door

(1) Removal.

(a) Open control cabinet door (8, fig. 4-50).

(b) Remove knurled nut (2) and instruction plate (1) from pushbutton (3) at front of control cabinet door (8) and remove pushbutton and contact block (5, fig. 4-51) from rear of control cabinet door.

(c) Remove the 11 other START and STOP pushbuttons, contact blocks and instruction plates (1 and 4, fig. 4-50) in a manner similar to that described above.

(2) Cleaning and Inspection.

(a) Clean START and STOP pushbuttons and contact blocks with a clean, dry cloth.

(b) Replace START and STOP pushbuttons if spring return action is retarded of if they are apparently damaged.

(3) Installation.

(a) Position pushbutton (3) through rear of control cabinet door (8), install instruction plate (1) on the front of pushbutton, and secure with knurled nut (2).

(b) Install the 11 other START and STOP pushbuttons, contact blocks (5, fig. 4-51) and instruction plates (1, 4, fig. 4-50) in a similar manner.

(c) Close control cabinet door (8).

4-61. Low Water Level Indicator Light.

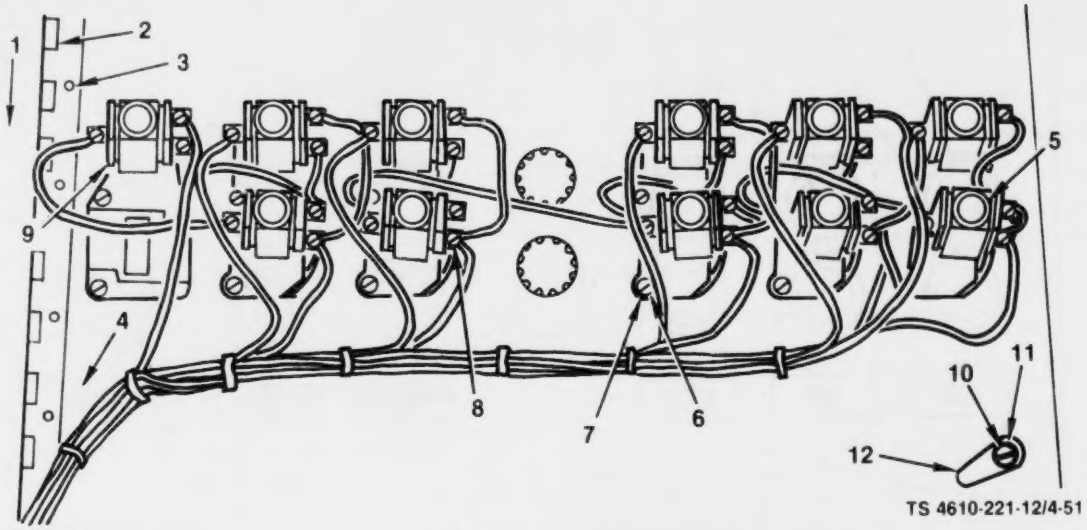
a. General. The low water level indicator light is located on top of control cabinet (fig. 2-9). It is actuated by low water level sensitive switch when there is a low water condition in wet well tank.

b. Removal and Disassembly.

(1) Turn guard (7, fig. 4-52) counterclockwise, screwing it off base (1).

(2) Turn globe (6) counterclockwise, screwing it out of base (1).

(3) Remove lamp (5) from receptacle (3).



TS 4610-221-12/4-51

Figure 4-51. Start and Stop Control Blocks and Brackets, Removal

Legend for figure 4-51:

1. Control cabinet
2. Hinge
3. Rivet
4. Control cabinet door
5. Stop contact block (5)
6. Screw, machine, No 8-32 x 5/8 in. (22)
7. Washer, lock, ET, No. 8 (22)
8. Terminal screw (22)
9. Start contact block (6)
10. Screw
11. Lockwasher
12. Latch

(4) Remove two screws (4) and lift receptacle (3) out of base (1).

(5) Remove screws (2, fig. 4-53) and tag and disconnect electrical wires (4) from receptacle (1). Remove receptacle (1). Remove receptacle from base (3).

(6) Remove gasket (2, fig. 4-52) from base (1).

(7) Turn base counterclockwise, screwing it off control cabinet.

c. *Cleaning and Inspection.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all metal parts with cleaning solvent (item 1, App. E) and dry thoroughly. Clean corrosion from electrical contact surfaces.

(2) Inspect base and guard for cracks, breaks, and damaged threads. Replace a damaged part.

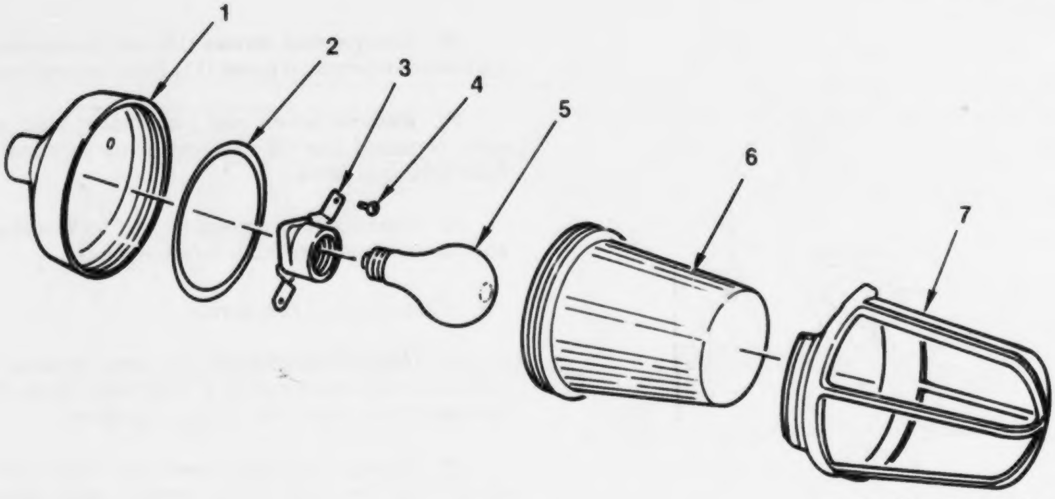
(3) Inspect globe for cracks and chips. Replace if damaged.

(4) Inspect receptacle for a cracked or chipped base and burned electrical contact surfaces. Replace if damaged.

d. *Reassembly and Installation.*

(1) Screw base (1, fig. 4-52) onto control cabinet.

(2) Install gasket (2) in base (1).



TS 4610-221-12/4-52

Figure 4-52. Low Water Level Indicator Light, Exploded View

Legend for figure 4-52:

1. Base
2. Gasket
3. Receptacle
4. Screw, machine, No. 8-32 x 1/4 in. (2)
5. Incandescent lamp, 110 volt, 100 watt
6. Globe
7. Guard

(3) Connect electrical wires (4, fig. 4-53) to receptacle (1), as tagged, and secure with screws (2).

(4) Position receptacle (3, fig. 4-52) in base (1) and secure with two screws (4).

(5) Install lamp (5) in receptacle (3).

(6) Screw globe (6) into base (1).

(7) Screw guard (7) onto base (1).

4-62. Warning Buzzer.

a. General. The warning buzzer is mounted in upper right-hand corner of control cabinet. The warning buzzer is supplied alternating current by stepdown transformer and is actuated when the buzzer toggle switch is on and a low water condition exists in the wet well tank.

b. Removal

(1) Open the control cabinet door.

(2) Remove two nuts (2, fig. 4-54) and tag and disconnect electrical leads (3) from warning buzzer (6).

(3) Remove two screws (5) and remove warning buzzer (6) from control cabinet (4).

c. Cleaning and Inspection.

(1) Clean warning buzzer with a clean, dry cloth.

(2) Inspect warning buzzer for evidence of a burned-out condition. Replace a defective warning buzzer.

d. Installation.

(1) Position warning buzzer (6, fig. 4-54) inside control cabinet (4) and secure with screws (5).

(2) Connect two electrical leads (3) to warning buzzer, as previously tagged, and secure with two nuts (2).

4-63. Terminal Board Assembly.

a. General. The terminal board assembly, located in lower right corner of control cabinet, provides a central point for connecting outside 110 volt power source to various components of water purification unit.

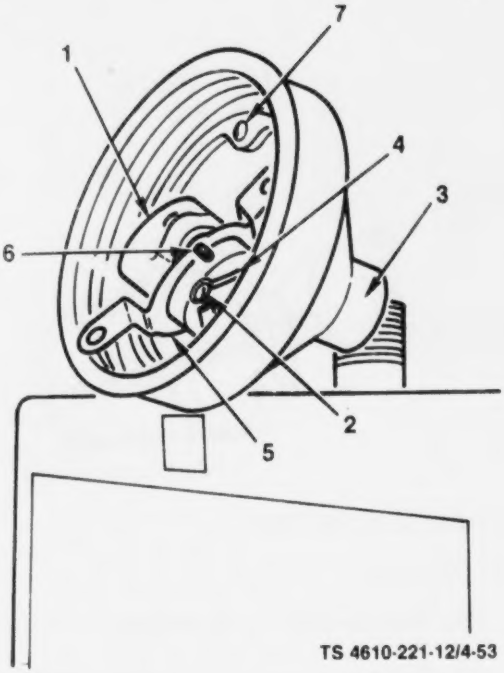


Figure 4-53. Low Water Level Indicator Light Base, Removal

Legend for figure 4-53:

1. Receptacle
2. Terminal screw, No. 8-32 x 1/2 in. (2)
3. Base
4. Wire (4)
5. Receptacle support
6. Screw
7. Screw

b. *Removal.*

(1) Open control cabinet door.

(2) Loosen the nuts of four terminal lugs (7, fig. 4-55) and disconnect power cable (8).

(3) Remove 26 screws (4) and lockwashers (3) and tag and disconnect electrical leads (5) from bus bars (6).

(4) Remove four screws (10) and lockwashers (9) and remove terminal panel (11) from control cabinet.

(5) Remove screw and lockwasher that secure each terminal lug (7). Remove four terminal lugs from terminal panel.

(6) Remove four screws (2) and lockwashers (3) and remove bus bars from terminal panel.

c. *Cleaning and Inspection.*

(1) Clean terminal panel, bus bars, terminal lugs, and attaching screws with a clean, dry cloth. Clean corrosion from electrical contact surfaces.

(2) Inspect terminal panel, bus bars, and terminal lugs for distortion, breaks, and damaged threads.

(3) Refer replacement requirements to Direct Support maintenance.

d. *Installation.*

(1) Position bus bars on terminal panel (11, fig. 4-55) and secure with four lockwashers (3) and screws (2).

(2) Install four terminal lugs (7) in terminal panel (11) and secure at rear with four lockwashers and screws.

(3) Install terminal panel (11) in control cabinet and secure with four lockwashers (9) and screws (10).

(4) Connect 26 electrical leads (5) to the bus bars, as tagged, and secure with lockwashers (3) and screws (4).

(5) Connect power cable (8) to four terminal lugs (7). Tighten nuts of terminal lugs to secure electrical leads and power cable.

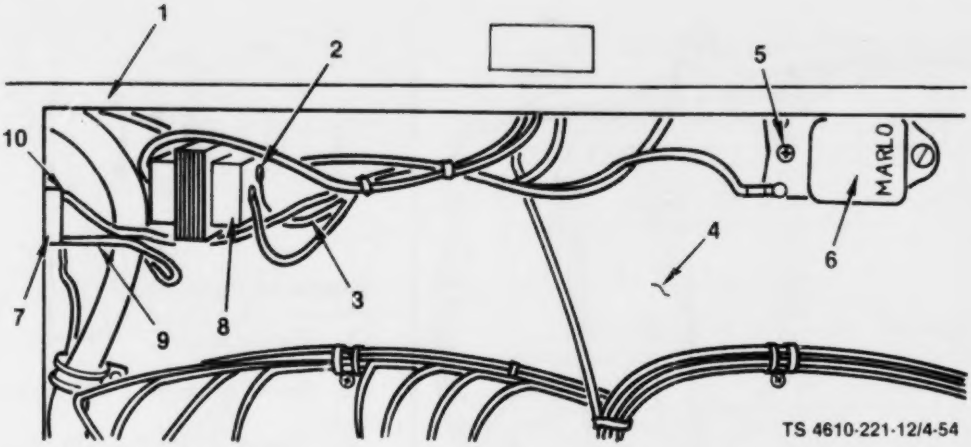
(6) Close control cabinet door.

4-64. Power Cable Assemblies.

a. *General.* Electrical cable extension assemblies are provided to connect generator set, raw water pump, and filtered water distribution pump to van unit.

b. *Inspect.* Inspect power cables for broken plugs, damaged insulation or broken wires.

c. *Replace.* Replace damaged cables.



TS 4610-221-12/4-54

Figure 4-54. Warning Buzzer and Stepdown Transformer, Removal

Legend for figure 4-54:

1. Door gasket
2. Screw, 6-32 (4)
3. Electrical lead (2)
4. Controll cabinet
5. Screw (2)
6. Warning buzzer
7. Warning buzzer toggle switch
8. Stepdown transformer
9. Electrical lead
10. Electrical lead

4-65. Wiring.

a. General. All instruments and controls in the electrical system are connected in the power circuit by a wiring harness in control cabinet. Other electrical wiring runs through the cable.

b. Inspection. Inspect insulation for cracked and frayed material. Pay particular attention to wiring passing through van body. If inspection reveals a broken or cut wire and the break in wire is exposed and readily accessible, repair wire as described in paragraph (d) below. If a break in a wire is in a wiring harness or in the cable, replace wire as directed in e. below.

c. Testing. Test continuity by disconnecting each end of wire from component to which it is attached. Touch probes of a test lamp to each end of wire. If the lamp does not light, wire is defective. Repair or replace a defective wire.

d. Repair. If a break in a wire passing through the van body or cable is readily accessible, shave away insulation on wire to expose 1/2 inch (13 mm) of bare wire at both ends of break. Twist bare wires together and solder connections. Cover repaired cut by wrapping electrical tape over entire area. Do not leave any bare wire exposed. If a receptacle connector breaks off the end of a wire or cable, replace it by using a wire terminal repair kit.

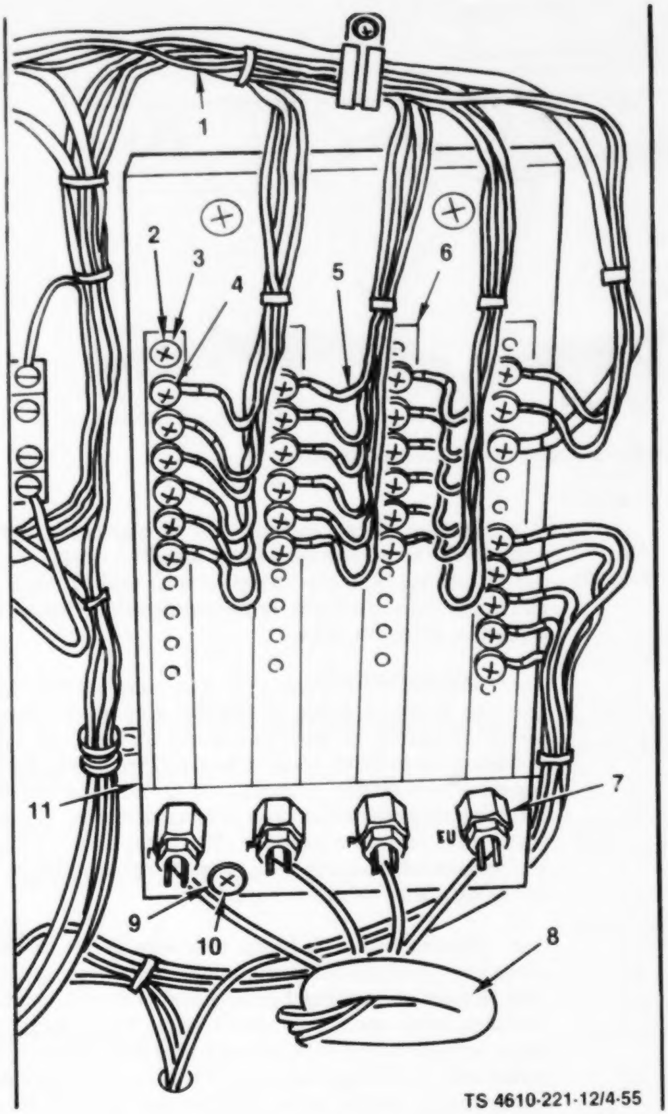
e. Replacement. If break in a wire is not readily accessible and cannot be repaired, replace cable. If a wire is part of a wiring harness and is defective, disconnect both ends and cover ends with electrical tape. Install a new wire of same size and attach it to outer side of wiring harness. If a complete rewiring is necessary, install wires of same size in accordance with wiring diagram. Where a harness has been used, rewire by using the old harness as a pattern.

NOTE

Be sure to identify a new wire with the same identification number of the one removed.

4-66. Twist-Lock Receptacle Connector.

a. General. Two 110 volt twist-lock receptacle connectors are located beneath the chemical solution feeder assembly and provide an electrical connection for raw water pump, slurry feeder motor, distribution pump, and erdlator agitator motor.



TS 4610-221-12/4-55

Figure 4-55. Terminal Board Assembly, Removal

Legend for figure 4-55:

1. Wiring harness
2. Screw, machine, 1/4-20 x 1 in. (4)
3. Washer, lock ET, 1/4 in. (4)
4. Screw, machine, 1/4-20 x 1/2 in. (26)
5. Electrical lead (26)
6. Bus bar
7. Terminal lug (4)
8. Power cable
9. Lockwasher (4)
10. Screw, machine (4)
11. Terminal panel

b. Removal.

(1) Remove four screws (5, fig. 4-56), and cover plate (6) from twist-lock receptacle connector (7).

(2) Remove two screws that secure twist-lock receptacle connector (7) to conduit box (9) and pull twist-lock receptacle connector as far out of conduit box as attached electrical leads will permit.

(3) Remove four screws (8) and tag and disconnect electrical leads from twist-lock receptacle connector (7).

(4) Remove other twist-lock receptacle connector in a similar manner.

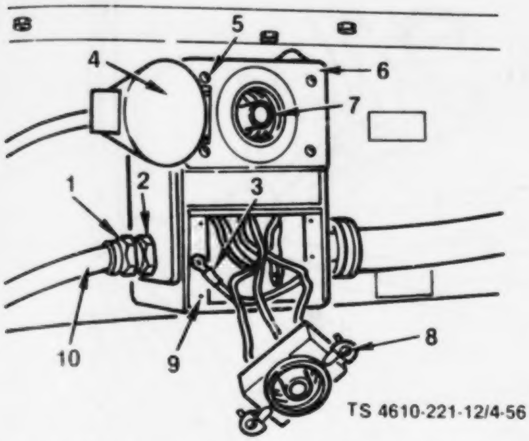


Figure 4-56. Twist-Lock Receptacle Connector, Removal

Legend for figure 4-56:

1. Connector nut
2. Connector
3. Screw, machine, 1/4-20 x 3/8 in.
4. Cover
5. Screw, machine, No. 6-32 x 1/2 in. (8)
6. Cover plate (4)
7. Twist-lock receptacle connector (2)
8. Screw (spec) (4)
9. Conduit box (2)
10. Cable

c. *Cleaning and Inspection.*

(1) Clean with a clean, dry cloth and inspect twist-lock receptacle connector and cover plate.

(2) Inspect twist-lock receptacle connector for a cracked and broken body and damaged or corroded terminal lugs. Replace twist-lock receptacle connector if it is damaged or fails to hold plug tight.

d. *Installation.*

(1) Connect four electrical leads to twist-lock receptacle connector (7, fig. 4-56) as previously tagged, and secure the four screws (8).

(2) Install twist-lock receptacle connector in conduit box (9) and secure with two screws.

(3) Position cover place (6) over twist-lock receptacle connector and secure with two screws.

(4) Install the other twist-lock receptacle connectors in a similar manner.

4-67. Fuse and Fuseholder.

a. *General.* The 208 amp, cartridge-type fuse, mounted in the fuseholder located in the lower left corner of the control cabinet, protects chemical solution feeder assembly from overload.

b. *Fuse Replacement.*

(1) Open control cabinet door.

(2) Remove burned out fuse (5), fig. 4-57) from fuseholder (3).

(3) Install a new fuse of same ampere rating as the old one in fuseholder (3).

(4) Close control cabinet door.

c. *Removal.*

(1) Remove fuse as described in paragraph b. above.

(2) Remove two terminal screws (2) and tag and disconnect electrical leads (1) from fuseholder (3).

(3) Remove two screws (4) and remove fuseholder (3) from control cabinet (10).

d. *Cleaning and Inspection.*

(1) Clean fuseholder with a clean, dry cloth. Clean corrosion from terminals and spring clips.

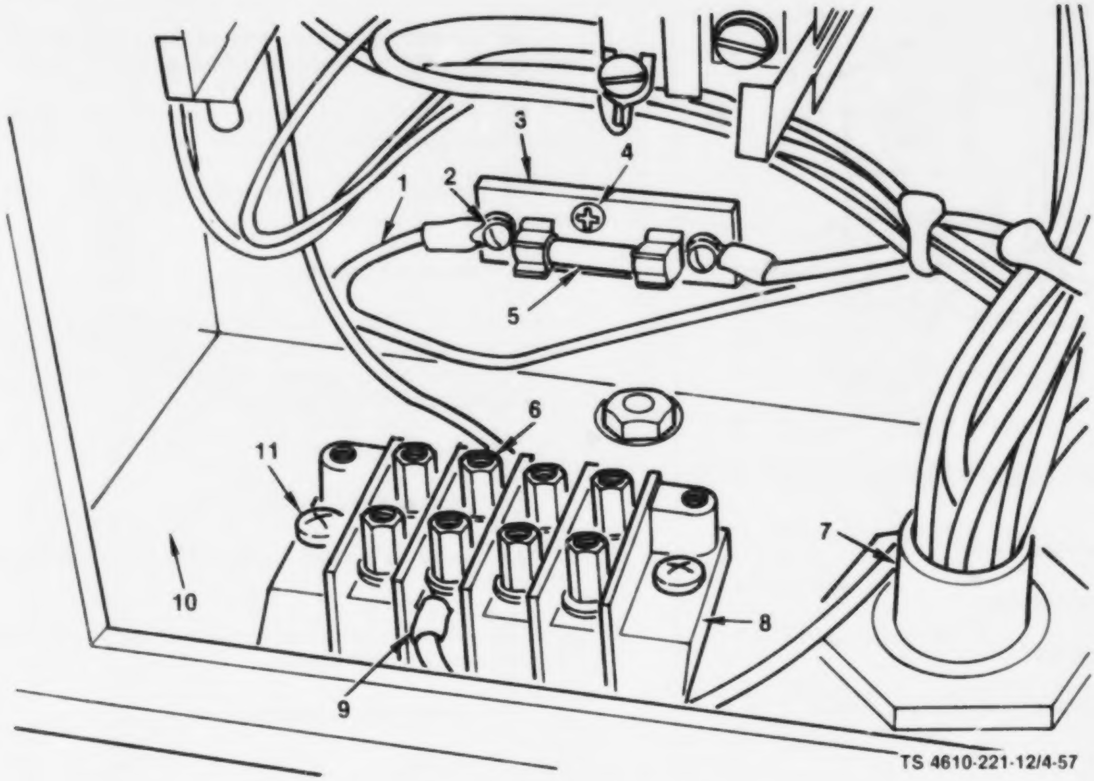
(2) Inspect fuseholder for cracks, breaks, sprung clips, and damaged threads. Replace fuseholder if it is unserviceable.

e. *Installation.*

(1) Install fuseholder (3, fig. 4-57) in control cabinet (10) and secure with two screws (4).

(2) Connect electrical leads (1) to fuseholder, as previously tagged, and secure with two terminal screws (2).

(3) Install fuse as described in paragraph b. above.



TS 4610-221-12/4-57

Figure 4-57. Fuse and Fuseholder, Removal

Legend for figure 4-57:

1. Electrical lead (2)
2. Terminal screw (2)
3. Fuseholder
4. Screw, machine, No. 8-32 x 5/8 in. (4)
5. Fuse, cartridge, 208 amp
6. Terminal screw
7. Wiring harness
8. Terminal strip
9. Electrical lead
10. Control cabinet
11. Screw (2)

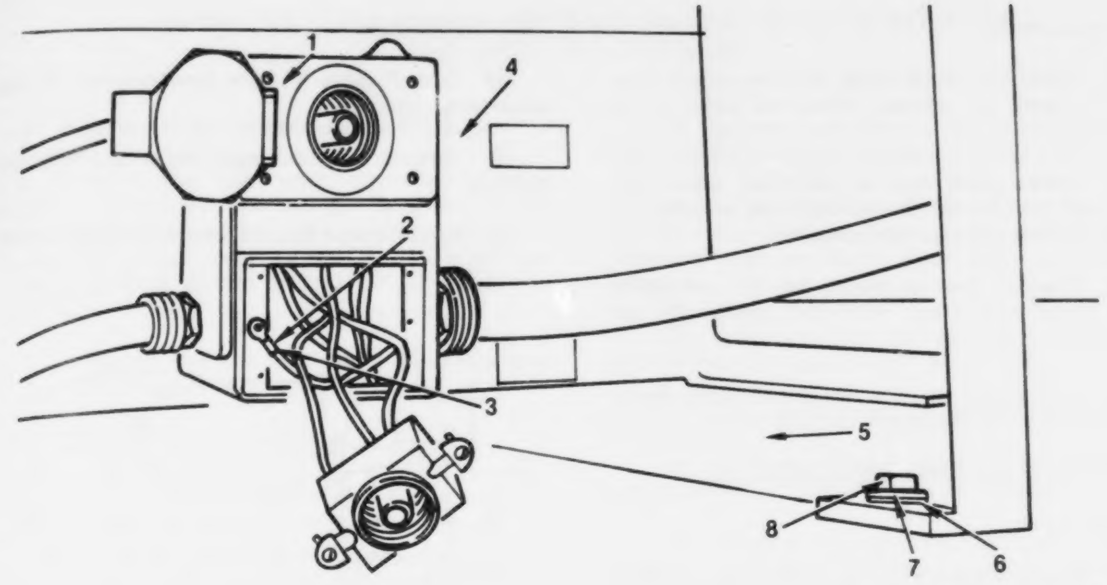


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Figure 4-58. Receptacle Box, Removal

Legend for figure 4-58:

1. Receptacle box
2. Washer, lock, 1/4 in. (4)
3. Screw, pan-hd, thd-forming, 1/4-20 in. (4)
4. Slurry feeder frame
5. Van body
6. Washer, flat, 1/2 in. (4)
7. Washer, lock, 1/2 in. (4)
8. Screw, cap, hex-hd, 1/2-13 x 1 1/2 in. (4)

4-68. Receptacle Box.

a. *Removal.*

(1) Remove slurry feeder and chemical solution feeder electrical cable from receptacle box (para 4-66).

(2) Remove screws (3, fig. 4-58) and lockwashers (2) that secure receptacle box (1) to slurry feeder frame (4).

(3) Disconnect electrical wires from the two receptacles and remove locknut inside receptacle box.

(4) Disconnect electrical wires inside control cabinet and remove locknut from cable inside control cabinet.

b. *Cleaning, Inspection, and Repair.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees c to 59 degrees C).

(1) Clean metal parts in cleaning solvent (item 1, App. E).

(2) Clean electrical wiring and receptacle box with a clean cloth dampened with cleaning solvent (item 1, App. E).

(3) Inspect receptacle box and cable connectors for damaged threads.

(4) Replace all unserviceable parts.

c. *Reassembly.*

(1) Insert electrical cable into receptacle box, install locknut and connect electrical wires to the receptacle.

(2) Insert other end of electrical cable into control cabinet, install the locknut and connect the electrical wires inside control cabinet.

(3) Position the receptacle box to the slurry feeder frame and secure with four screws (3) and washers (2).

(4) Connect the solution feeder and slurry feeder electrical cables to the receptacle box.

4-69. Filter Pump Cable and Junction Box.

a. *Removal.*

(1) Remove screws (2, fig. 4-59) from junction box (4), remove cover (3) and remove wire nuts (1) from connections.

(2) Disconnect electrical leads.

(3) Remove locknut cable inside junction box and remove cable (6).

b. *Cleaning, Inspection, and Repair.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean filter pump junction box, mounting hardware and metal components in cleaning solvent (item 1, App. E).

(2) Clean cable with a dry, clean, lint-free cloth.

(3) Inspect cable for broken or damaged insulation, broken wires, and a damaged or missing connector.

(4) Repair or replace a damaged or missing connector. If insulation is dried and cracked, replace cable.

c. *Installation.*

(1) Install cable (6) into junction box (4) and secure with locknut.

(2) Connect electrical leads and secure with wire nuts (1).

(3) Install cover (3) and secure with screws (2).

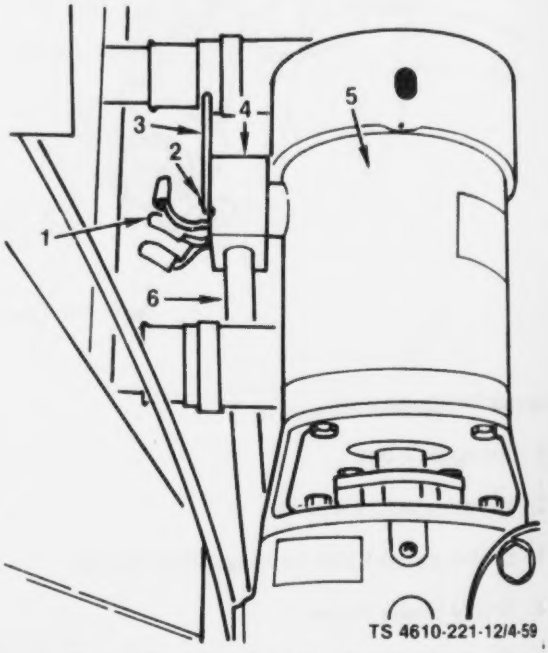


Figure 4-59. Filter Pump Junction Box, Removal

Legend for figure 4-59:

1. Wire nut (3)
2. Screw (2)
3. Cover
4. Junction box
5. Filter pump motor
6. Cable

Section XV. MAINTENANCE OF GAGES, WEIGHING AND MEASURING DEVICES

4-70. Raw Water Pressure Gage and Fittings.

a. General. The raw water pressure gage is located between the two influent launders in raw water piping. It registers pressure in raw water piping. The normal operating reading of this pressure gage, with both control valves CV-10 and CV-11 open, is 5 to 7 psi.

b. Removal. Remove raw water pressure gage (1, fig. 2-2) from aspirator manifold (2).

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean raw water pressure gage with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect raw water pressure gage for cracks, breaks, apparent water leaks, a broken glass, loose pointer, or illegible numbers. Inspect the threads of pressure gage and fitting.

(3) Replace a damaged or defective raw water pressure gage.

d. Installation. Install raw water pressure gage (1) in aspirator manifold (2).

4-71. Influent and Effluent Pressure Gages and Fittings

a. General. The influent pressure gage is mounted in left side of mounting bracket on filtered water pipe. The effluent pressure gage is mounted in right side of mounting bracket. The influent pressure gage registers pressure of coagulated water delivered to diatomite filter assembly and effluent pressure gage registers pressure of filtered water as it leaves the diatomite filter assembly.

b. Removal.

(1) Loosen two tube nuts (10, fig. 4-60) and remove copper tube (11) from between pipe-to-tube adapter (12) and pipe-to-tube elbow (9).

(2) Remove pipe-to-tube elbow (9) from bushing (8) and bushing from pressure gage (16).

(3) Remove two nuts (7) and remove gage retaining bracket (6) from rear of pressure gage (16). Remove pressure gage from front of mounting bracket (1).

(4) Remove pipe-to-tube adapter (12) from plug cock (13) and plug cock from pipe nipple.

(5) Remove draincock (15) from pipe tee (14).

(6) Remove pressure gage (16), plug cock (13), draincock (15), and fittings in a similar manner.

(7) Remove two nuts (3), lockwashers (2), capscrews (4), strap (5), and gage mounting bracket (1), from filtered water piping.

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean influent and effluent pressure gages, plug cocks, draincocks, and pipe fittings with cleaning solvent, (item 1, App. E) and dry thoroughly.

(2) Inspect filter pressure gage for cracks, breaks, apparent water leaks, broken glass, loose pointer, or illegible numbers. Inspect threads of pressure gage and fitting.

(3) Inspect plug cocks and draincocks for cracks, breaks, damaged screw threads, and restricted valve action. Replace a damaged or defective plug cock or draincock.

(4) Inspect gage mounting bracket for cracks, breaks, distortion, and illegibility. Replace a defective or damaged gage mounting bracket.

d. Installation.

(1) Install gage mounting bracket (1, fig. 4-60) and strap (5) on filtered water piping and secure with two nuts (3), lockwashers (2), and capscrews (4).

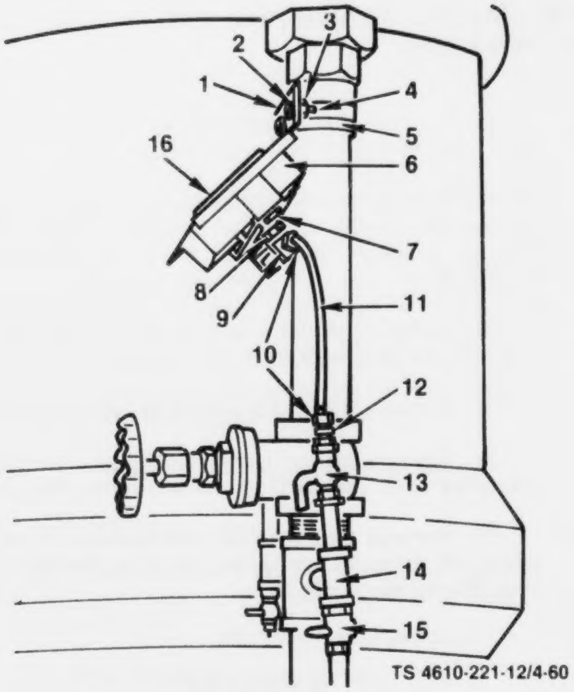


Figure 4-60. Filter Pressure Gages, Removal

Legend for figure 4-60:

1. Mounting bracket
2. Washer, lock, 1/4 in. (2)
3. Nut, plain, hex, 1/4-20 (2)
4. Screw, cap, hex-hd, 1/4-20 x 3/4 in. (2)
5. Strap
6. Gage retaining bracket
7. Nut, plain, hex, 3/16 in. (2)
8. Bushing, 1/8 x 1/4 in. (2)
9. Elbow, pipe-to-tube, 1/4 in. (2)
10. Nut, tube, 1/4 in. (4)
11. Copper tube, 1/4 in. (2)
12. Adapter, pipe-to-tube, 1/4 in. (2)
13. Plug cock, 1/4 in. (2)
14. Tee, pipe, 1/4 in. (2)
15. Draincock, 1/4 in. (2)
16. Pressure gage (2)

(2) Install draincock (15) in pipe tee (14).

(3) Install plug cock (13) on pipe nipple and pipe-to-tube adapter (12) in plug cock.

(4) Position pressure gage (16) in mounting bracket (1) and secure at rear with gage retaining bracket (6) and two nuts (7).

(5) Install bushing (8) on pressure gage and pipe-to-tube elbow (9) on bushing (8).

(6) Connect copper tube (11) between pipe-to-tube elbow (9) and pipe-to-tube adapter (12) and tighten tube nuts (10) on each end of copper tube to secure tube.

(7) Install pressure gage (16), plug cock, (13), draincock (15), and fittings in a similar manner.

4-72. Fittings.

For removal, replacement, and installation of filter pressure gage fittings, refer to paragraph 4-71.

4-73. Filter Gage Mounting.

For removal, replacement, and installation of filter gage mounting bracket, refer to paragraph 4-71.

4-74. Rate of Flow Indicator.

a. General. The rate of flow indicator is mounted on top front of erdlator tank by a mounting bracket and indicates, in gallons per minute, amount of water being introduced into erdlator tank.

b. Removal (All Units Except 816-1083).

(1) Remove two nuts (5, fig. 4-61) that secure U-bolt clamp (4) to mounting bracket.

(2) Remove four bolts (6) and nuts (7) that secure meter extension pipe (8) to raw water piping (1).

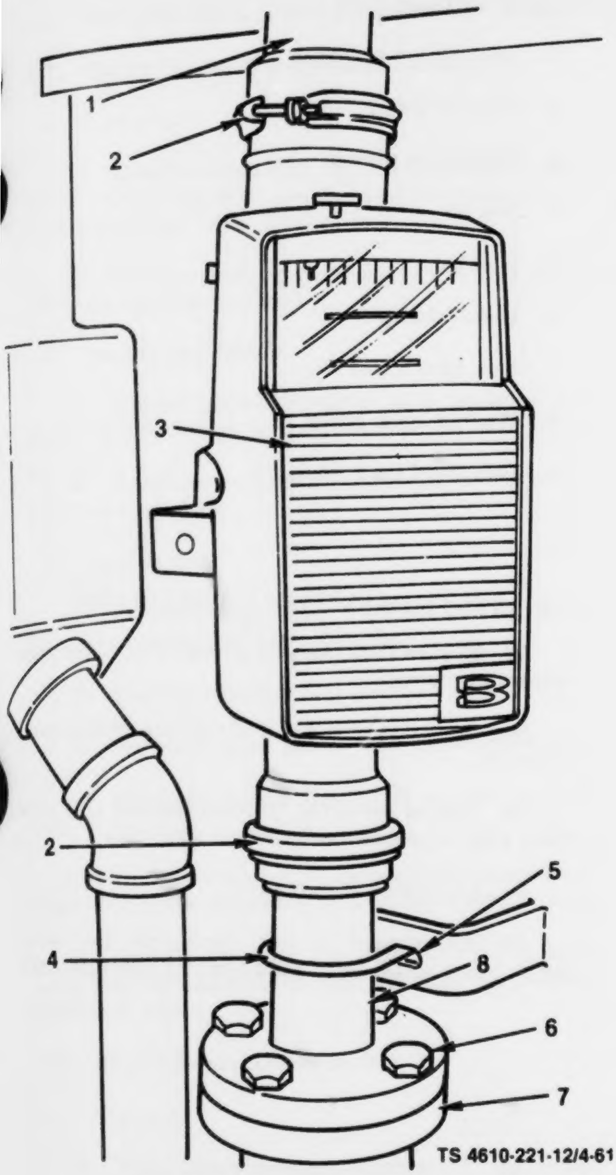
(3) Remove upper clamp (2) and remove the meter extension pipe from the raw water piping.

(4) Remove lower clamp (2) and separate meter extension pipe (8) from raw water indicator (3).

c. Removal (Unit Serial Numbers 816-1083).

(1) Remove two nuts (4, fig. 4-62) that secure U-bolt clamp (6) to mounting bracket (5).

(2) Remove eight nuts (7) and lockwashers (8) which hold flowmeter (1) to adjoining pipe flanges (2).



TS 4610-221-12/4-61

Figure 4-61. Rate of Flow Indicator, Removal (All Units Except 816-1083)

Legend for figure 4-61:

1. **Raw water piping**
2. **Clamp (2)**
3. **Rate of flow indicator**
4. **U-bolt clamp**
5. Nut (2)
6. Bolt, 5/8-11 x 2 1/4 in. (4)
7. Nut, hex, 5/8-11 (4)
8. Extension pipe

(3) Remove eight bolts (9) which hold flowmeter in alignment.

(4) Remove flowmeter assembly (1) from raw water piping (3).

d. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean rate of flow indicator and parts with cleaning solvent (item 1, App. E) and dry thoroughly.

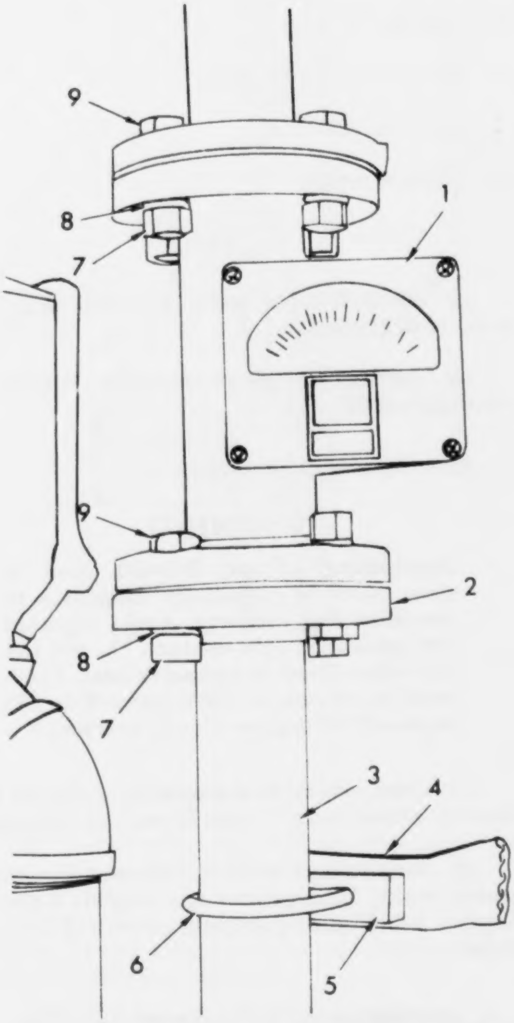
(2) Inspect rate of flow indicator for cracks, breaks, leaks, loose pointer and illegible markings. Replace a damaged or inoperative rate of flow indicator.

e. Installation (All Units Except 816-1083).

(1) Install rate of flow indicator (3, fig. 4-61) into meter extension pipe (8) and secure with lower clamp (2).

(2) Install rate of flow indicator (3) and extension pipe (8) into raw water piping (1) and secure with upper clamp (2) and four bolts (6) and nuts (7).

(3) Secure meter extension pipe (8) to mounting bracket with U-bolt clamp (4) and two nuts (5).



TS 4610-221-12/4-62

Figure 4-62. Rate of Flow Indicator, Removal (Unit Serial Numbers 816-1083)

f. Installation (Unit Serial Numbers 816-1083).

(1) Install rate of flow indicator assembly (1, fig. 4-62) into piping (3) with eight bolts (9).

(2) Secure the bolts with lockwashers (8) and nuts (7).

(3) Replace U-bolt (6) and fasten with nuts (4).

Legend for figure 4-62:

1. Rate of flow indicator
2. Pipe flange (2)
3. Raw water piping
4. Nut (2)
5. Bracket
6. U-bolt clamp
7. Nut, hex, 5/8-11 (8)
8. Washer, lock, 5/8 in.
9. Bolt, 5/8-11 x 2 1/4 in. (8)

g. Adjustment (All Units Except 816-1083).

(1) Ensure that there is no water flow through raw water piping.

(2) Open door (10, fig. 4-61) of rate of flow indicator (3).

(3) Adjust setscrew (9) until pointer (11) coincides with reference mark on indicator scale.

(4) Close door of indicator.

(5) Adjustment is not applicable for water purification units, serial numbers 816 through 1083.

Section XVI. MAINTENANCE OF WATER PURIFICATION EQUIPMENT

4-75. Slurry Feeder Windows and Gaskets.

a. *Removal.*

(1) Remove screws (19, fig. 4-63), nuts (31), and washers (32) from windows (21) and remove window assemblies from feeder assembly.

(2) Remove or separate gaskets (20) and glass (21) from window frames (18).

b. *Inspect and Repair.*

(1) Inspect glass windows and gaskets for cracks, discoloration, and deterioration.

(2) Repair or replace all damaged or defective windows or gaskets.

c. *Installation.*

(1) Position inner window gasket (20, fig. 4-63) on window mounting base of feeder.

(2) Position window (21) on inner gasket (20).

(3) Position outer gasket (20) on window (21).

(4) Position window frame (18) on outer gasket (20).

(5) Insert screws (19) through the mounting holes in window assembly and feeder window base.

(6) Install a washer (32) and nut (31) on each screw and tighten nuts enough to compress gaskets to prevent leaks.

4-76. Slurry Feeder Door Latches.

a. *Removal.*

(1) Turn charging door latches (11, fig. 4-63), counterclockwise and open door (8).

(2) Loosen screws (14) holding door latch knobs (9).

(3) Remove screws (14), washers (10, 12, 13), latches (11) and knobs (9).

b. *Inspect and Replace.*

(1) Inspect latch parts for damage.

(2) Replace any damaged parts.

c. *Installation.*

(1) Assemble knobs, washers, latches, and screws.

(2) Tighten screws.

(3) Close door.

4-77. Chemical Slurry Feeder Agitator Shaft Bearing Packing.

a. *Description.* The agitator shaft bearings are equipped with packing to prevent leakage between bearings and shaft (5, fig. 4-64). The packing may be compressed or adjusted as necessary if leaks occur.

b. *Removal.*

(1) Loosen nut (4) and slide it back on agitator shaft)5).

(2) Remove spring and washer from bearing and slide them back on shaft (5).

(3) Remove packing with a piece of heavy wire or a small screwdriver.

NOTE

Do not loosen or remove lockwasher (2) or locknut (3) when replacing or adjusting packing.

c. *Installation and Adjustment.*

(1) Place a new packing around agitator shaft (5) and push it into bearing housing (1) with washer and spring and install nut (4).

(2) Adjust packing by loosening or tightening nut (4) until there is a slight drag on shaft when turned by hand.

CAUTION

Make sure packing is not binding on shaft as this will cause undue wear on packing.

4-78. Chemical Solution Feeder.

a. *General.* The chemical solution feeder assembly consists of two diaphragm pumps with necessary hoses to pump chemical solutions to erdlator tank.

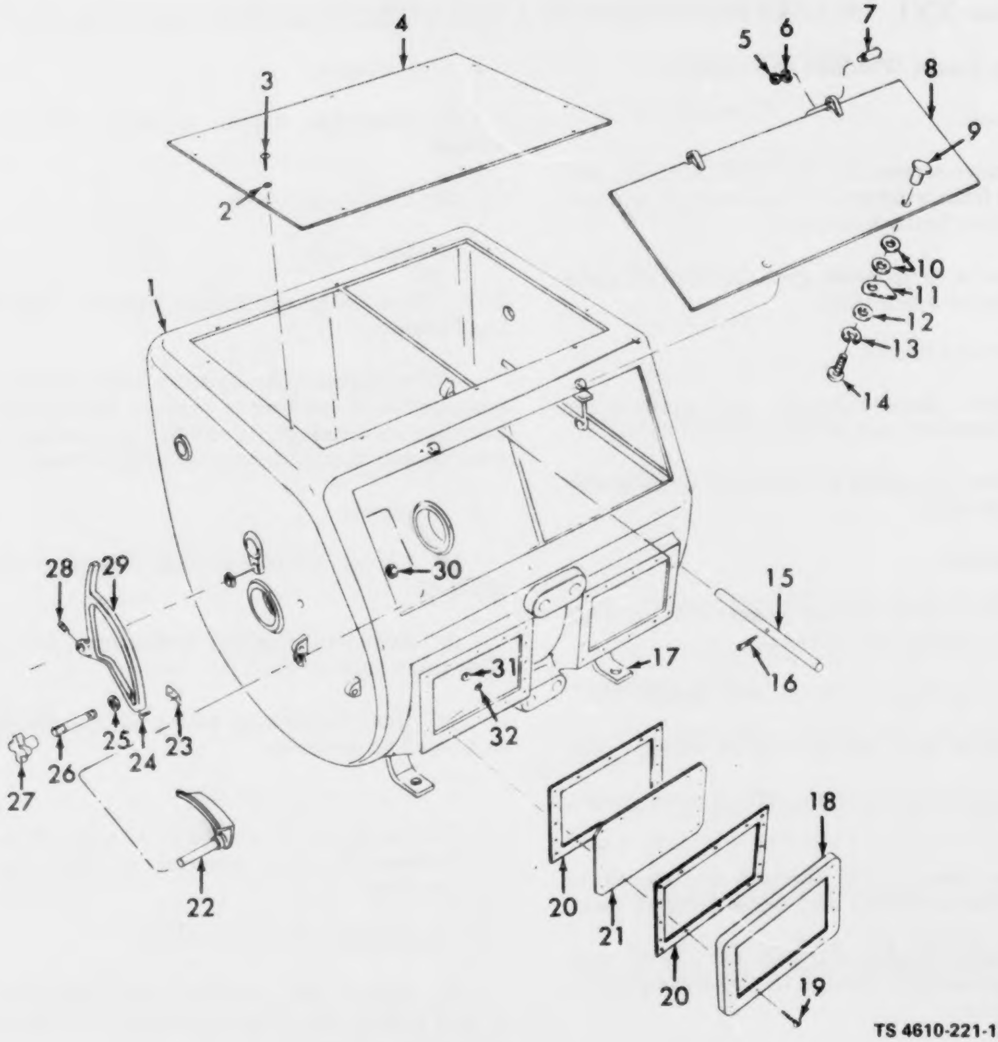

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Figure 4-63. Slurry Feeder Windows, Removal

Legend for figure 4-63:

1. Slurry feeder housing
2. Washer, lock, No. 12 (10)
3. Screw, machine, No. 12-25 x 1 3/8 in. (2)
4. Cover plate
5. Nut, plain, hex, No. 10-24 x 1 3/8 in. (2)
6. Washer, lock, No. 10 (2)
7. Screw, shoulder, No. 10-24 x 1 3/8 in. (2)
8. Charging door
9. Knob (2)
10. Washer, flat, 1/2 in. (4)
11. Latch (2)
12. Washer, flat, No. 8 (2)
13. Washer, lock, No. 8 (2)
14. Screw, machine, No. 8-32 x 3/8 in. (2)
15. Door support rod
16. Pin, cotter, 1/8 x 3/4 in. (2)
17. Support
18. Window frame)2)
19. Screw, cap, 2/4-20 x 1 1/2 in. (32)
20. Window gasket (4)
21. Window (2)
22. Cover assembly (2)

23. Quadrant indicator (2)
24. Screw, drive, No. 4 x 3/16 in. (4)
25. Washer, flat, 3/8 in. (2)
26. Stud, plain, 3/8-16 x 1 1/2 in. (2)
27. Handwheel (2)
28. Setscrew, 1/4-20 x 3/8 in. (2)
29. Quadrant (2)
30. Nut, plain, hex, 3/8-16 (2)
31. Nut, plain, hex, 1/4-20 (32)
32. Washer, lock, 1/4 in. (32)

b. Removal.

(1) Disconnect electrical cable assembly from right side of chemical solution feeder assembly (8, fig. 4-65).

(2) Loosen four hose clamps (5) and disconnect plastic tubes (4) from chemical solution feeder assembly.

(3) Remove four bolts (9) and remove chemical solution feeder assembly (8) from slurry feeder frame (10).

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean chemical solution feeder assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

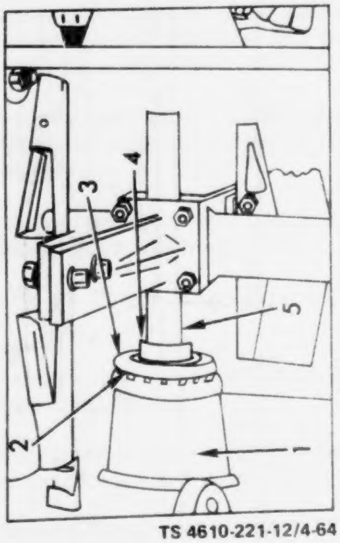
(2) Inspect chemical solution feeder assembly for faulty operation and oil leaks. Replace a defective chemical solution feeder assembly.

d. Installation.

(1) Position chemical solution feeder assembly (8, fig. 4-65) on slurry feeder frame (10) and secure with four bolts (9).

(2) Connect four plastic tubes (4) to chemical solution feeder assembly and secure each tube with a hose clamp (5).

(3) Connect cable assembly to chemical solution feeder assembly.



TS 4610-221-12/4-64

Figure 4-64. Slurry Feeder Shaft Bearing

Legend for figure 4-64:

1. Bearing housing
2. Washer, lock, 2.406 id (2)
3. Nut, lock (2)
4. Nut, bronze, 1 5/8 in. (2)
5. Agitator shaft

4-79. Effluent Launder Rubber Boot.

a. General. The effluent launder rubber boot is located between effluent launder and wet well tank. Clear water collected by effluent launder flows through rubber boot to wet well tank.

b. Removal.

(1) Loosen screw in each hose clamp (2, fig. 4-66) and slide hose clamp off rubber boot (3).

(2) Remove rubber boot from between wet well tank (1) and effluent launder (4).

(3) Remove hose clamp (2) from wet well tank and effluent launder.

c. Cleaning and Inspection.

(1) Clean rubber boot with a solution of soap and water and rinse thoroughly with clear water.

(3) Inspect rubber boot for cracks, tears, and deterioration. Replace a defective rubber boot.

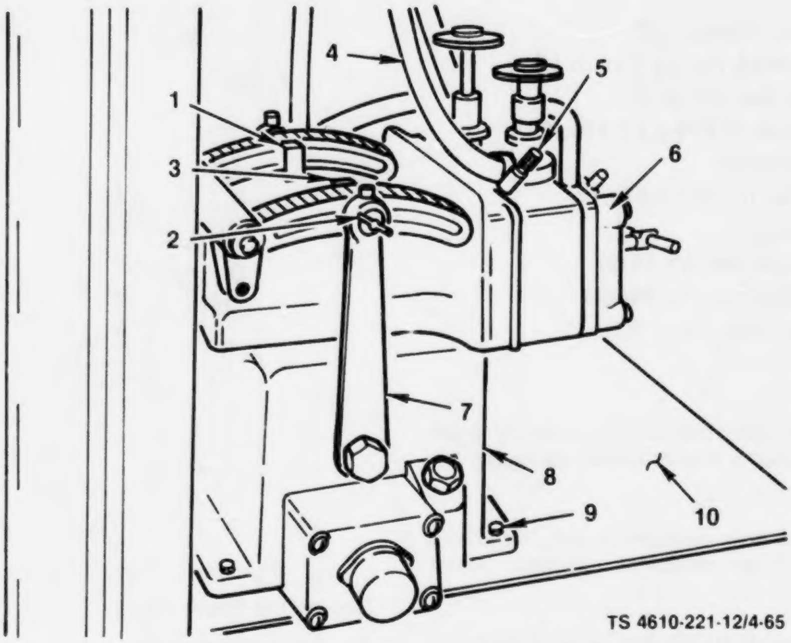


Figure 4-65. Chemical Solution Feeder, Removal

Legend for figure 4-65:

1. Ferric chloride feed variator (FEI-7)
2. Wingnut (2)
3. Calcium hypochlorite feed variator (FEI-8)
4. Plastic tube (4)
5. Hose clamp (4)
6. Pump
7. Driving arm (2)
8. Chemical solution feeder assembly
9. Bolt, machine, 1/4-20 x 1 1/4 inch (4)
10. Slurry feeder frame

(3) Inspect hose clamp for cracks and stripped screw threads. Replace a defective hose clamp.

d. *Installation*

(1) Install one hose clamp (2, fig. 4-66) on extension of wet well tank (1) and the other clamp on extension of effluent launder (4).

(2) Install rubber boot (3) on the extension of wet well tank and the extension of effluent launder, spacing it evenly on both.

(3) Slide the hose clamps (2) over each end and tighten.

4-80. Diatomite Filter Assembly.

a. *Removal.*

(1) Disconnect pipe unions and slip joint couplings in the piping to filter housing.

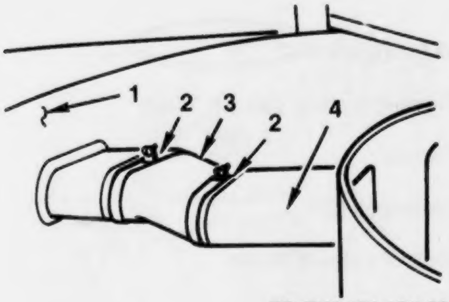
(2) Remove assemblies of piping from the filter housing.

(3) Remove three nuts (7, fig. 4-67), lockwashers (6), and capscrews (8) and remove diatomite filter assembly (11) from the floor of van body.

b. *Cleaning and Inspection.*

(1) Clean filter assembly with soap and water and rinse thoroughly.

(2) Inspect for cracks, breaks, distortion and other damage.



TS 4610-221-12/4-66

Figure 4-66. Effluent Launder Rubber Boot, Removal

Legend for figure 4-66:

1. Wet well tank
2. Hose clamp, 18 in. dia. (2)
3. Rubber boot, 4 1/2 in. id x 6 in. long
4. Effluent launder

(3) Replace a damaged filter assembly.

c. *Installation.*

(1) Position diatomite filter assembly (11) inside van body and secure to van body floor with three capscrews (8), lockwashers (6), and nuts (7).

(2) Install assemblies of piping on filter housing.

(3) Connect pipe unions and slip joint couplings in piping to filter housing.

4-81. Filter Housing and Cover.

a. *Disassembly.*

(1) Remove filter assembly as described in paragraph 4-80.

(2) Remove air release valve (para 4-95).

(3) Remove filter elements as described in paragraph 3-25.

(4) Remove 16 nuts, (9, fig. 4-68) and remove long window strips (3), short window strips (4), gaskets (5 and 7), and window (6) as an assembly from inside filter housing (8).

(5) Separate outside window gasket (7), window (6), inside window gaskets (5), short window strips (4), and long window strips (3).

(6) Remove four nuts (9), lockwashers (12), and capscrews (10) and separate precoat funnel (11) from filter housing (8).

(7) Remove precoat funnel (11) from coagulated water piping to three way plug valve.

(8) Remove flange gasket (1) from filter housing (8).

(9) Remove six adapter bushings (2) from bottom of filter housing (8).

(10) Disassemble unit, serial numbers 816-1083 in a similar manner using figure 4-69.

(11) Loosen hose clamp (6, fig. 4-70) and remove plastic tubing (5) from nipple (7). Remove hose clamp from plastic tubing.

(12) Remove pipe nipple (7) from angle valve (8), angle valve from pipe nipple (9), nipple from bushing (10), and bushing from filter housing cover (1).

b. *Cleaning and Inspection.*

WARNING

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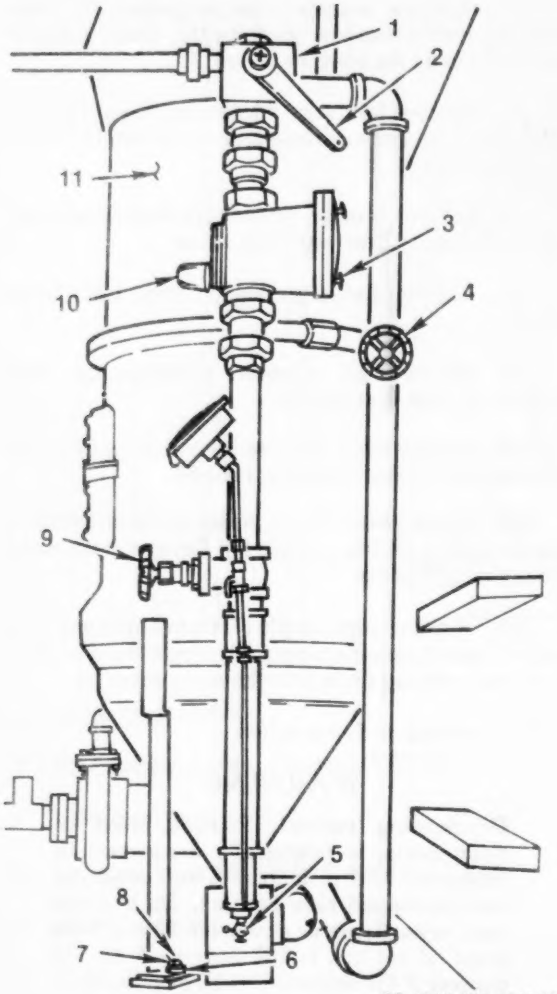
(1) Clean precoat funnel inside and out with cleaning solvent (item 1, App. E) and rinse thoroughly with clear, filtered water.

(2) Inspect precoat funnel for cracks, breaks, distortion, and damaged screw threads. Straighten minor bends and replace precoat funnel if otherwise damaged.

(3) Inspect window for cracks and chips, scratches, and opaqueness of glass. Replace a defective window.

(4) Inspect window strips for cracks, breaks, and damaged screw threads. Replace damaged or defective window strips and gaskets.



TS 4610-221-12/4-67

Figure 4-67. Diatomite Filter Tank, Removal

Legend for figure 4-67:

1. Three-way plug valve (CV-46)
2. Handle
3. Draincock (2)
4. Control valve (CV-50)
5. Draincock (DC-39)
6. Washer, lock, 1/2 in. (3)
7. Nut, plain, hex, 1/2-13 (3)
8. Screw, cap, 1/2-13 x 6 1/2 in. (3)
9. Control valve (CV-40)
10. Flow control valve (CV-45)
11. Diatomite filter assembly

(5) Clean all parts of filter housing and cover with a solution of soap and water, paying particular attention to removing mineral deposits from within filter housing. Thoroughly rinse all parts with clear, filtered water. Be sure all soap film has been removed.

(6) Inspect flange gasket for cracks, breaks, and deterioration. Replace a damaged or defective flange gasket.

(7) Inspect two halves of clamping ring for warpage and distortion. Inspect welds of clamping ring for cracks or breaks. Do not attempt to straighten a warped or distorted clamping ring, but replace it.

(8) Inspect filter housing and filter housing cover for cracks, breaks, distortion, and damaged screw threads. Replace a damaged filter housing or filter housing cover.

c. *Reassembly.*

(1) Install bushing (10, fig. 4-70) in filter housing cover (1), pipe nipple (9) in bushing, and angle valve (8) on pipe nipple (9). Install pipe nipple (7) in angle valve (8).

(2) Install plastic tubing (5) on nipple (7) and secure wtih hose clamp (6).

(3) Install six adapter bushings (2, fig. 4-68 or 4-69) in the bottom of filter housing (8).

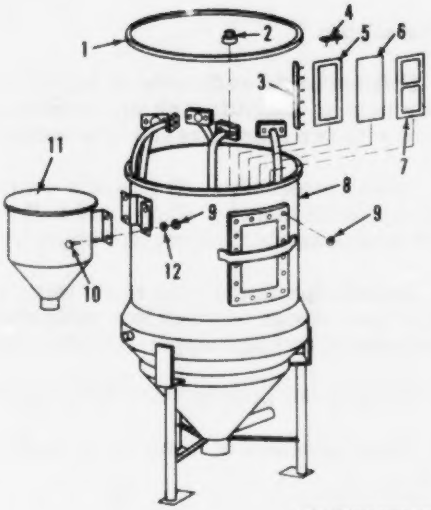
(4) Install flange gasket (1) in the recess provided in rim of filter housing.

(5) Install precoat funnel (11) on coagulated water piping to three way plug valve.

(6) Position precoat funnel (11, fig. 4-68 or 4-69) on left side of filter housing (8) and secure with four capscrews (10), lockwashers (12), and nuts (9).

(7) Assemble inside window gasket (5), window (6), and outside window gasket (7) to short window strips (4) and long window strips (3).

(8) Position window strips, gaskets, and window inside filter housing (8) and secure assembly with 16 nuts (9).



TS 4610-221-12/4-68

Figure 4-68. Filter Housing, Exploded view (All Units Except 816-1083)

Legend for figure 4-68:

1. Flange gasket
2. Adapter bushing (6)
3. Long window strip (2)
4. Short window strip (2)
5. Inside window gasket
6. Window
7. Outside window gasket
8. Filter housing
9. Nut, hex, 1/4-20 (20)
10. Screw, cap, 1/4-20 x 5/8 in. (4)
11. Precoat funnel
12. Washer, lock, 1/4 in. (4)

(9) Install filter elements as described in paragraph 3-25.

(10) Install air release valve (para 4-95).

(11) Install filter assembly as described in paragraph 4-80.

4-82. Waste Water Tank and Grating.

a. General. The waste water tank is mounted on van body floor next to erdlator tank. The waste water tank has a wrought iron grating over the top of it to allow the operator to stand on it. The waste water tank collects waste water and sludge and allows it to flow out through outlets to outside of van body.

b. Removal.

(1) Remove hoses (1, fig. 4-71) from waste water tank (8).

(2) Remove grating (2) from waste water tank.

(3) Remove pipe nipple (3) from elbow (4), elbow (4) from pipe nippe (5), and pipe nipple (5) from waste water piping that runs from sludge concentrator tank.

(4) Disconnect pipe union (7). Remove half of pipe union (7) from pipe nipple (5), pipe nipple (5) from street elbow (6), and street elbow (6) from waste water tank (8).

(5) Remove two capscrews and lockwashers that secure each end of waste water tank and remove waste water tank from van body.

c. Cleaning and Inspection

WARNING

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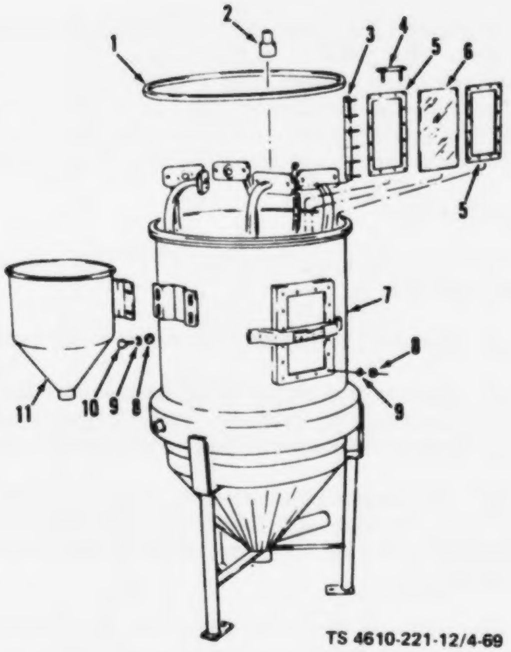
(1) Clean waste water tank and grating with cleaning solvent (item 1, App. E). Use a wire brush to remove scales and rinse thoroughly with clean water.

(2) Inspect waste water tank for cracked or broken welds, corrosion, and distortion. Straighten minor distortions, reweld cracked or broken welds, and remove corrosion and paint exposed metal surfaces. Replace an unserviceable waste water tank or grating.



TS 4610-221-12/4-69

Figure 4-69. Filter Housing, Exploded View (Unit Serial Numbers 816-1083)

Legend for figure 4-69:

1. Flange gasket
2. Adapter bushing (6)
3. Long window strip (2)
4. Short window strip (2)
5. Window gasket (2)
6. Window
7. Lower filter housing
8. Nut, hex, 1/4-20 (20)
9. Washer, lock, 1/4 (20)
10. Screw, cap 1/4-20 x 5/8 (4)
11. Precoat funnel

d. *Installation.*

(1) Position waste water tank (8, fig. 4-71) inside van body next to erdlator tank and secure to van body floor with two capscrews and lockwashers.

(2) Install street elbow (6) in waste water tank (8), pipe nipple (5) in street elbow, and half of pipe union (7) on pipe nipple. Connect pipe union (7).

(3) Install pipe nipple (5) in waste water piping that runs from sludge concentrator tank, elbow (4) to pipe nipple (5), and pipe nipple (3) in elbow (4).

(4) Install grating (2) on waste water tank (8).

(5) Place loose end of hoses (1) in waste water tank.

4-83. Chemical solution Tank.

a. *General.* The two metal-rubber lined chemical solution tanks are located below and to the right of chemical solution feeder assembly. The chemical solution tanks are used to supply calcium hypochlorite and ferric chloride which is pumped to erdlator tank by chemical solution feeder assembly.

b. *Removal.*

(1) Remove nut (2, fig. 4-72) and washer (3) from stud (9) and lift clamp arm (4) from covers (11).

(2) Remove covers (1) from tanks (5 and 6).

(3) Remove two tanks from slurry feeder frame.

(4) Remove stud (9) from slurry feeder frame.

c. *Cleaning and Inspection.*

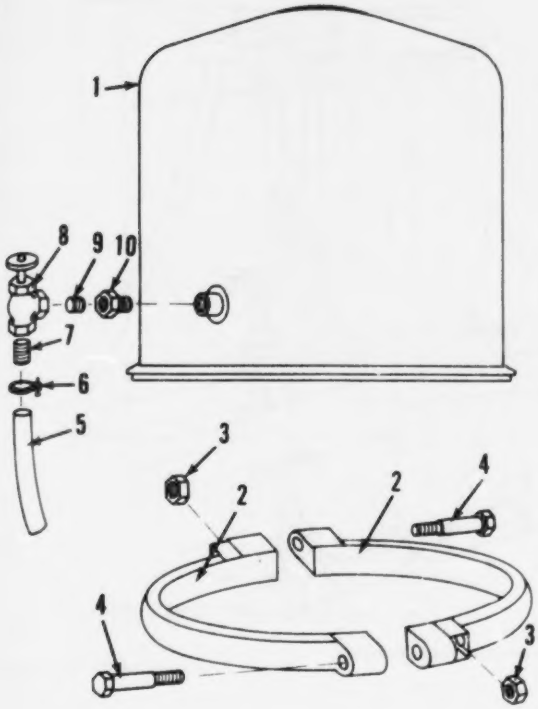
(1) Clean inside and outside of chemical solution tank in a solution of strong soap and water. After cleaning, rinse thoroughly with clean water.

(2) Inspect synthetic rubber lining of chemical solution tanks and tank covers for cracks, deterioration and corrosion. Replace tank covers or chemical solution tanks if rubber lining is defective or if tanks leak.

(3) Inspect stud for damaged threads and distortion. Replace stud if defective.

d. *Installation.*

(1) Install stud (9, fig. 4-72) in slurry feeder frame.



TS 4610-221-12/4-70

Figure 4-70. Filter Housing Cover, Exploded View

Legend for figure 4-70:

1. Filter housing cover
2. Clamp assembly (two parts)
3. Nut, hex, 5/8-18 (2)
4. Screw, cap, 5/8-18 x 6 in. (2)
5. Tubing, plastic, 1/2 in. id (18 in.)
6. Hose clamp
7. Nipple, pipe, 3/8 x 2 in.
8. Valve, angle, 3/8 in.
9. Nipple, pipe, 3/8 x 1 1/2 in.
10. Bushing, 3/8 x 1/2 in.

(2) Position two tanks (6 and 5) on either side of stud.

(3) Install two covers (1).

(4) Position clamp arm (4) over covers on stud (9) and secure with flat washer (3) and nut (2).

4-84. Diatomite Dilution Tank.

a. *General.* The diatomite dilution tank is mounted on the left side of slurry feeder assembly and provides storage for diatomite slurry that is delivered to diatomite filter assembly. The diatomite dilution tank also functions as an area where diatomite slurry is further diluted with coagulated water to permit free flowing.

b. *Removal.*

(1) Loosen hose clamp (12, fig. 4-73) and disconnect plastic tube from diatomite dilution tank (16).

(2) Loosen hose clamp (15) and disconnect plastic tube (14) from bottom of diatomite dilution tank (16).

(3) Remove two nuts, lockwashers, and capscrews (18) and remove diatomite dilution tank (16) from slurry feeder (4).

c. *Disassembly.*

(1) Remove two nuts (11, fig. 4-74), washers (12), and screws (13) and remove bracket (10) from inside tank (6).

(2) Remove float (9), with attached parts, from tank (6).

(3) Remove needle valve seat (7) from lower needle valve (8) and remove two needle valves (8) from float.

(4) Remove pipe-to-tube adapter (1) from pipe elbow (2), pipe elbow from nipple (3), and nipple from float valve seat (4).

(5) Remove float valve seat (4) and gasket (5) from bottom of tank (6).

(6) Remove adapter (17) from elbow (18) and remove pipe bushing from tank (6).

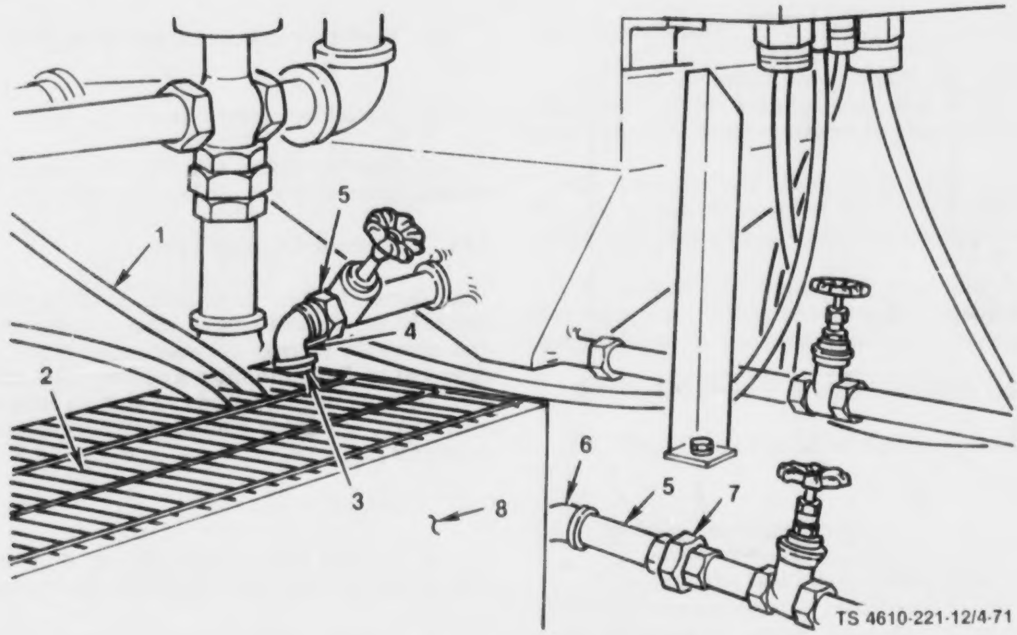


Figure 4-71. Waste Water Tank and Grating, Removal

Legend for figure 4-71:

1. Hose (4)
2. Grating
3. Nipple, pipe, 1 x 3 in.
4. Elbow, pipe, 1 in.
5. Nipple, pipe, 1 x 2 in. (2)
6. Elbow, street, 1 in.
7. Union, pipe, 1 in.
8. Waste water tank

d. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of the diatomite dilution tank with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect float for leaks and damaged screw threads. Replace a damaged float.

(3) Inspect needle valve for wear and deterioration. Replace a defective needle valve seat. Inspect needle valves for wear, distortion, and damaged screw threads. Replace a defective needle valve seat.

(4) Inspect tank for cracks or broken welds, damaged screw threads, and distortion. Repair or replace a defective tank.

(5) Inspect pipe fittings for cracks, breaks, and damaged threads. Repair or replace all defective parts.

e. Reassembly.

(1) Install elbow (18, fig. 4-74) in tank (6) and adapter (17) in the elbow.

(2) Install gasket (5) and float valve seat (4) in bottom of tank (6).

(3) Install pipe nipple (3) in float valve seat (4), pipe elbow (2) on pipe nipple, and pipe-to-tube adapter (1) in pipe elbow (2).

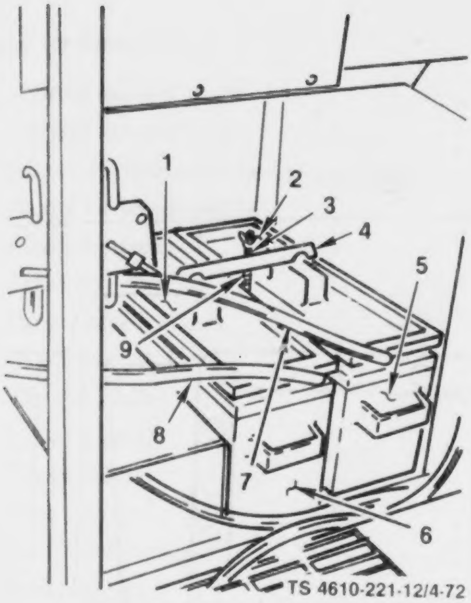


Figure 4-72. Chemical Solution Tanks

Legend for figure 4-72:

1. Cover (2)
2. Nut, plain, wing, 1/2-13
3. Washer, flat, 1/2 in.
4. Clamp arm
5. Ferric chloride solution tank
6. Calcium hypochlorite solution tank
7. Plastic tube
8. Plastic tube
9. Stud, 1/2-13 x 15 in.

(4) Install a needle valve (8) in each end of float (9) and install needle valve seat (7) on one of the needle valves (8).

(5) Position float (9) in tank (6) with needle valve seat (7) resting on bottom of tank.

(6) Position bracket (10) in tank (6) over top needle valve and secure bracket to tank with two screws (16), nuts (11), and lockwashers (12).

f. Installation.

(1) Position diatomite dilution tank (6, fig. 4-73) on slurry feeder (4) and secure with two nuts, lockwashers, and capscrews (18).

(2) Connect plastic tube (14) to bottom of diatomite dilution tank (16) and secure hose clamp (15).

(3) Connect plastic tube (11) to diatomite dilution tank and secure with hose clamp (12).

4-85. Erdlator Tank Assembly.

a. Removal.

(1) Remove all raw water piping and disconnect waste water and coagulated water piping from erdlator tank assembly.

(2) Remove two capscrews (8, fig. 4-75) and lockwashers (7) and remove control valves (1 and 2) from sludge concentrator tank (6).

(3) Remove drawoff piping (5), with attached block, from sludge concentrator tank.

(4) Remove two nuts, lockwashers, and capscrews (10, fig. 4-47) and remove mounting bracket (9) from erdlator tank (13).

(5) Remove rate of flow indicator in accordance with paragraph 4-74.

(6) Remove toolbox as described in paragraph 4-24.

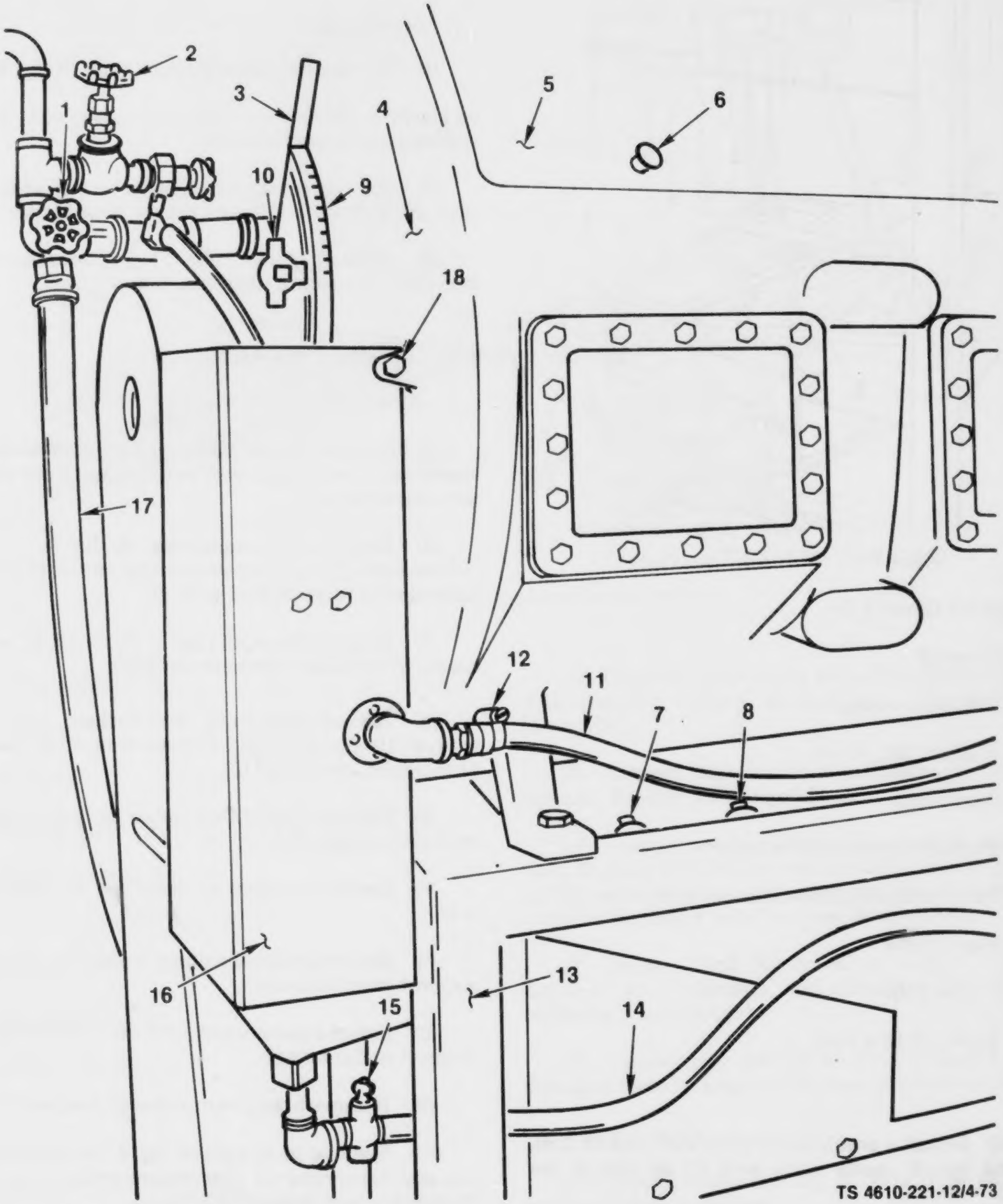
(7) Remove control cabinet (refer this to direct support maintenance).

(8) Remove downcomer tube (refer this to direct support maintenance).

(9) Remove bridge rails (refer to para 4-87).

(10) Remove three nuts (4, fig. 4-76), lockwashers (5), and capscrews (3) that secure erdlator tank (1) to erdlator tank mounting plate (6).

(11) Remove two screws (1, fig. 4-77) and lockwashers (3) that secure sludge concentrator tank (1) to floor of van body (4).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TS 4610-221-12/4-73

Figure 4-73. Diatomite Dilution Tank

Legend for figure 4-73:

1. Control valve (CV-33)
2. Control valve (CV-32)
3. Diatomite slurry feeder variator (FEI-5)
4. Slurry feeder assembly
5. Charging door
6. Latch (2)
7. Drain valve (DV-26)
8. Drain valve (DV-27)
9. Variator scale
10. Locking knob
11. Plastic tube
12. Hose clamp
13. Slurry feeder frame
14. Plastic tube
15. Hose clamp
16. Diatomite dilution tank
17. Hose, 6 ft.
18. Screw, cap, 1/4-20 x 1 1/4 inch (3)

Legend for figure 4-74:

1. Adapter, straight, brass, pipe-to-tube 1/2 in.
2. Elbow, pipe, 1/2 x 1/4 in.
3. Nipple, pipe, 1/2 x 1 1/2 in.
4. Float valve seat
5. Gasket
6. Tank
7. Needle valve seat
8. Needle valve (2)
9. Float
10. Bracket
11. Nut, hex, No. 6-32 (2)
12. Washer, lock, No. 6 (2)
13. Screw, machine (2)
14. Nut, plain, 1/4-20 (2)
15. Washer, lock, 1/4 in. (2)
16. Screw (2)
17. Adapter
18. Elbow, 1/2 in. male pipe thread by 1/2 in. tube

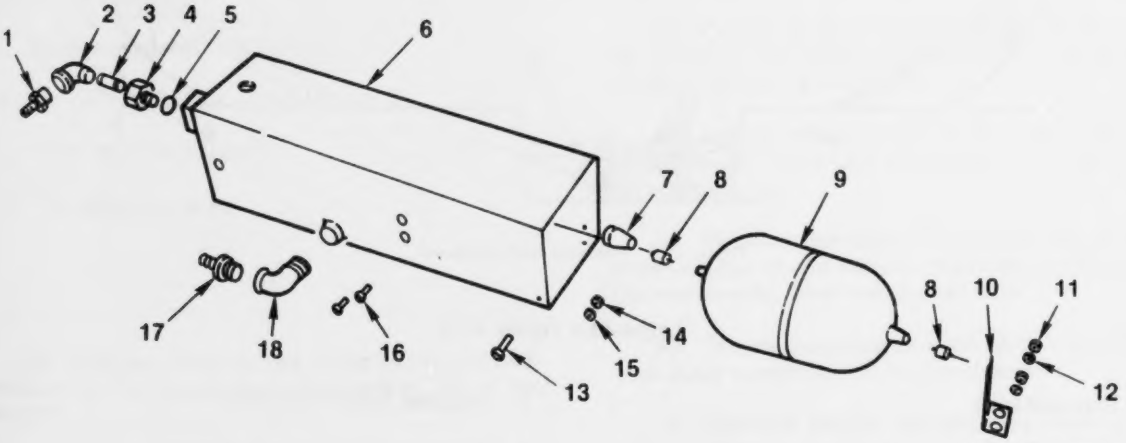

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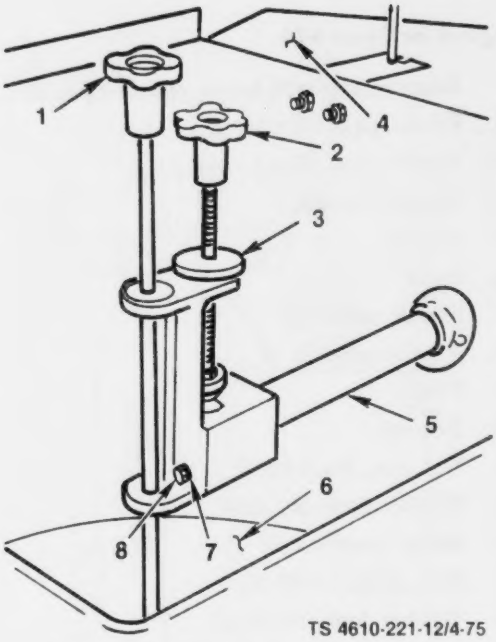
Figure 4-74. Diatomite Dilution Tank, Exploded View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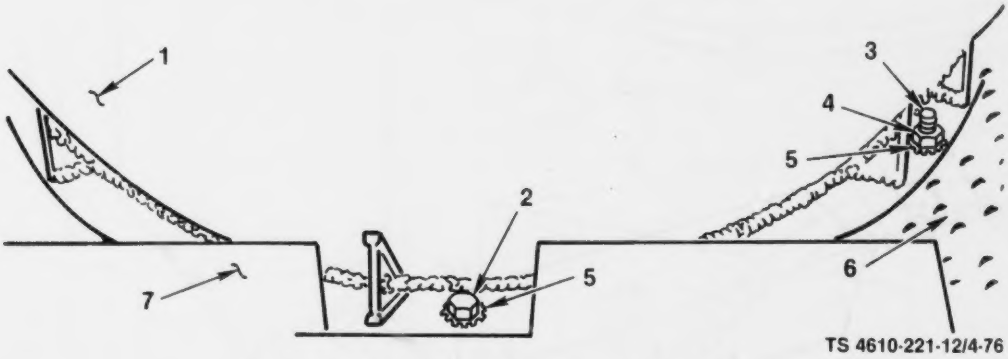
TS 4610-221-12/4-75

Figure 4-75. Sludge Concentrator Tank

Legend for figure 4-75:

1. Control valve (CV-16)
2. Control valve (CV-17)
3. Jamnut (spec)
4. Wet well tank
5. Drawoff piping
6. Sludge concentrator tank
7. Washer, lock, 1/4 in. (2)
8. Screw cap, 1/4-20 x 1/2 in. (2)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TS 4610-221-12/4-76

Figure 4-76. Erdlator tank, Removal

Legend for figure 4-76:

1. Erdlator tank
2. Screw, cap, hex-hd, 1/2-13 x 2 in. (4)
3. Screw, cap, hex-hd, 1/2-13 x 7 1/2 in. (4)
4. Nut, plain, hex, 1/2-13 (4)
5. Washer, lock, 1/2 in. (8)
6. Erdlator tank mounting plate
7. Van body wheel well

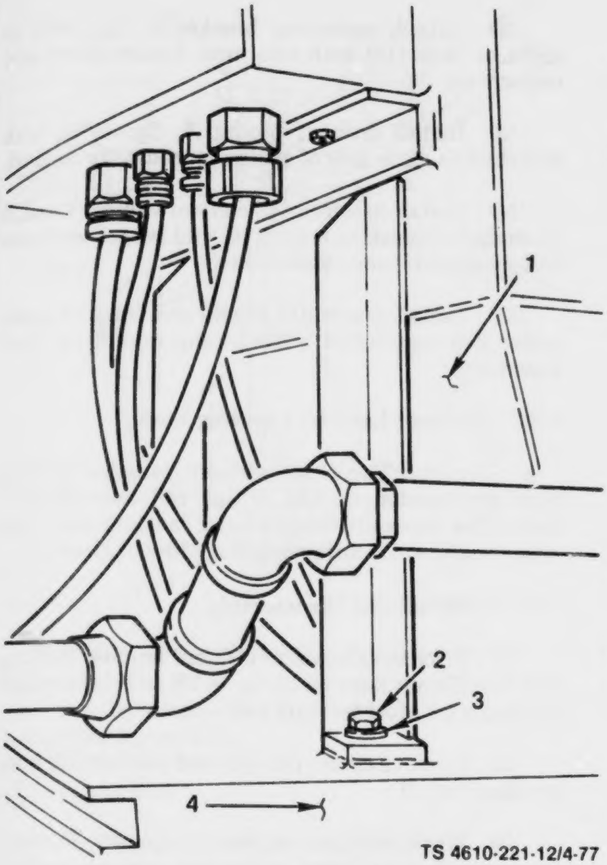


Figure 4-77: Erdlator Tank, Installed

Legend for figure 4-77:

1. Sludge concentrator tank
2. Screw, cap, hex-hd, 1/2-13 x 1 in. (2)
3. Washer, lock, 1/2 in. (2)
4. Van body

(12) Remove three screws (4, fig. 4-78) and lockwashers (3) that secure mounting bracket (2) to van body (1).

(13) Remove three nuts, lockwashers, capscrews (5), and flat washers (6) and remove mounting bracket (2) from erdlator tank (8).

(14) Lift erdlator tank (1, fig. 4-76) high enough to clear wheel well (7) and remove it from van body.

(15) Remove three capscrews (2) and lockwashers (5) and remove erdlator tank mounting plate (6) from van floor.

b. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrfees F (38 degrees C to 59 degrees C).

(1) Clean sludge from bottom of tank by using a pressure hose and clean water.

(2) Clean entire tank with cleaning solvent (item 1, App. E). Use a stiff brush to remove sediment and scale.

(3) Inspect tank for dents, cracks, and punctures.

(4) Repair cracks or punctures by welding and straighten dents in tank.

(5) Replace tank if it cannot be repaired.

c. Installation.

(1) Install erdlator tank mounting plate (6, fig. 4-76) in van body and secure with three lockwashers (5) and capscrews (2).

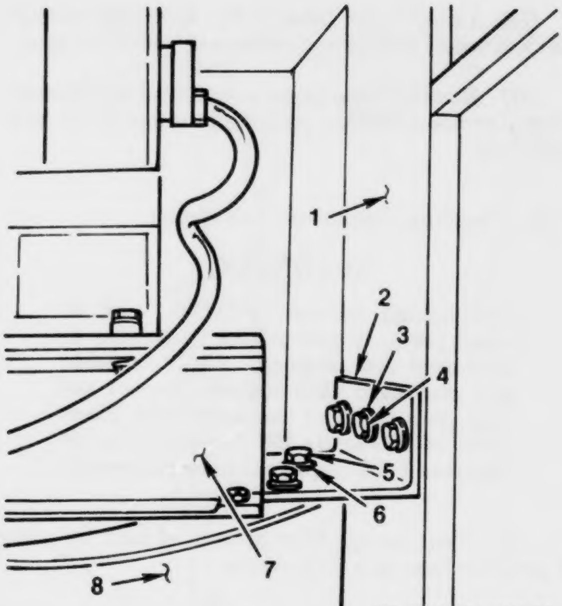
(2) Install erdlator tank (1) on mounting plate (6) and secure with four capscrews (3), lockwashers (5), and nuts (4).

(3) Position mounting bracket (2, fig. 4-78) on erdlator tank (8) and secure with three capscrews (5), flat washers (6), lockwashers and nuts.

(4) Secure mounting bracket (2) to van body (1) with three screws (4) and lockwashers (3).

(5) Position sludge concentrator tank (1, fig. 4-77) to floor of van body (4) and secure with two screws (2) and lockwasher (3).

(6) Secure erdlator tank mounting plate (6, fig. 4-76) to van floor with four screws (2) and lockwashers (5).



TS 4610-221-12/4-78

Figure 4-78. Erdlator Tank Mounting Brackets

Legend for figure 4-78:

1. Van body
2. Mounting bracket
3. Washer, lock, 3/8 in. (6)
4. Screw, cap, hex-hd, 3/8-16 x 1 1/2 in. (3)
5. Screw, cap, hex-hd, 3/8-16 x 1 in. (3)
6. Washer, flat, 13/32 id x 13/16 od (3)
7. Bridge rail
8. Erdlator tank

(7) Install bridge rails (refer to para 4-87).

(8) Install downcomer tube (refer this to direct support maintenance).

(9) Install control cabinet (refer this to direct support maintenance:

(10) Install toolbox as described in para 4-24.

(11) Install rate of flow indicator in accordance with paragraph 4-74.

(12) Attach mounting bracket (9, fig. 4-47) to erdlator tank (13) with two nuts, lockwashers, and capscrews.

(13) Install drawoff piping (5, fig. 4-75), with attached block, in side of sludge concentrator tank (6).

(14) Install assembly of control valves (1 and 2) in sludge concentrator tank (6) and secure with two lockwashers (7) and capscrews (8).

(15) Install raw water piping and connect waste water and coagulated water piping in erdlator tank assembly.

4-86. Effluent Launder Leveling Rods.

a. *General.* The three effluent launder leveling rods are located on the bridge rail over erdlator tank. The three effluent launder leveling rods support and provide adjustment of effluent launder.

b. *Removal and Disassembly.*

(1) Prior to removal of effluent launder leveling rod, tie effluent launder (9, fig. 4-79) to bridge rail (8) to support it after leveling rod is removed.

(2) Remove cotter pin (11) and washer (10) from leveling rod (3)..

(3) Mark position of lower collar (4). Remove setscrew (5) from lower collar and remove leveling rod from effluent launder (9), collar (4), and support (12).

(4) Mark position of upper collar (4). Remove setscrew (5) from upper collar and remove upper collar from leveling rod.

(5) Remove pin (2) and remove handwheel (1) from leveling rod.

(6) Remove two capscrews and remove effluent launder nut (7) from effluent launder.

(7) Remove and disassemble the two other effluent launder leveling rods in a similar manner.

c. *Cleaning and Inspection.*

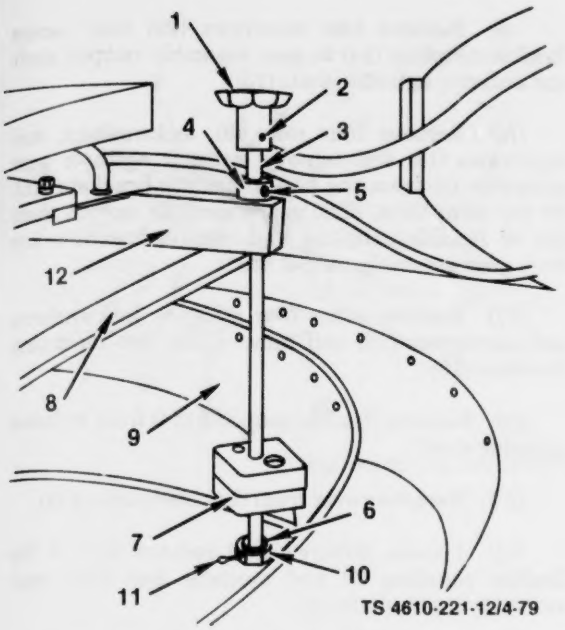


Figure 4-79. Effluent Launder Leveling Rods, Removal

Legend for figure 4-79:

1. Handwheel
2. Pin, straight, headless, 1/8 x 3/4 in.
3. Leveling rod
4. Collar (2)
5. Setscrew, 1/4-20 x 1/2 in. (2)
6. Nut, self-locking, 3/8-24
7. Effluent launder nut
8. Bridge rail
9. Effluent launder
10. Flat washer, 3/8 in.
11. Cotter pin, 3/32 x 3/4 in.
12. Support

WARNING

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(1) Clean all the parts of effluent launder leveling rod with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect parts of effluent launder leveling rod for cracks, breaks, and damaged threads. Replace all defective parts.

d. Reassembly and Installation.

(1) Position effluent launder nut (7, fig. 4-79) on effluent launder (9) and secure with two capscrews.

(2) Install handwheel (1) on end of leveling rod (3), aligning pin holes in each, and drive pin (2) through aligned holes.

(3) Install upper collar (4) on leveling rod, at location previously marked, and secure with setscrew (5).

(4) Insert leveling rod through the support (12), lower collar (4) and into effluent launder (9).

(5) Secure lower collar (4) to leveling rod (3), at location previously marked, and secure with setscrew (5).

(6) Secure leveling rod (3) to effluent launder (9) with washer (10) and cotter pin (11).

(7) Remove the material that was used to tie effluent launder to bridge rail (8).

(8) Reassemble and install the two other effluent launder leveling rods in a similar manner.

4-87. Bridge Rails.

a. Removal.

(1) Remove agitator motor assembly as described in paragraph 4-47.

(2) Remove screws (1, fig. 4-80), washers (3 and 4) and nuts (5) that secure agitator motor base (2) to motor mount plate (6).

(3) Lift agitator motor base (2) from motor mount plate (6).

(4) Remove flexible coupling cover (5, fig. 4-81) by removing screws (19), gaskets (20), seals (17) and washers (18).

(5) Loosen setscrew (3) that secures gear assembly input shaft (16, fig. 4-82) to flexible coupling (2). Remove erdlator drive shaft (5), with bearing units (4) and flexible coupling (2), from mounting brackets (10).

(6) Remove machine key (1, fig. 4-81) from gear assembly input shaft (16, fig. 4-82).

(7) Remove cover from flexible coupling (14, fig. 4-82).

(8) Remove master link in flexible coupling chain (3) and remove flexible coupling chain from the two halves of flexible coupling (14).

(9) Remove two setscrews (20) that secure flexible coupling (14) to gear assembly output shaft and erdlator agitator shaft (13).

(10) Remove four nuts (8), lockwashers, and capscrews (12) and remove erdlator agitator gear assembly (1) from the two mounting brackets (15). At the same time, slide gear assembly output shaft out of flexible coupling and remove machine key from gear assembly output shaft.

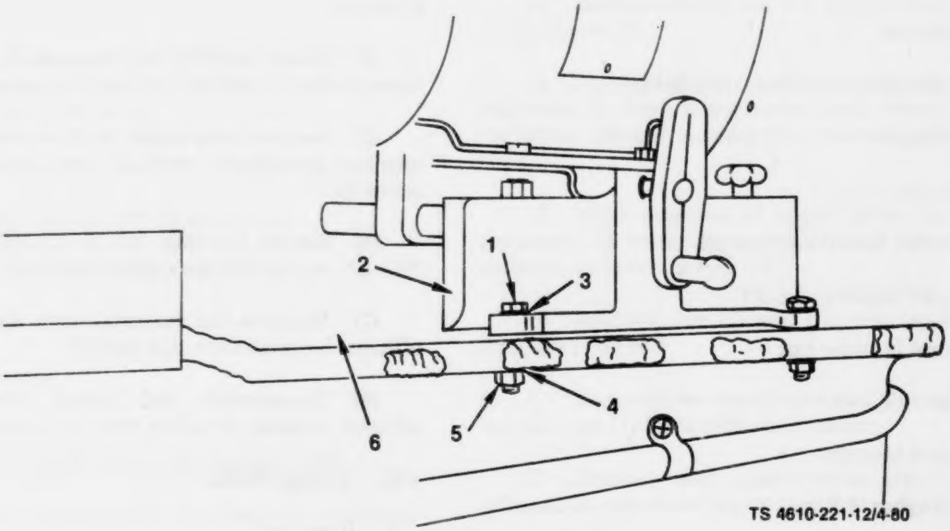
(11) Remove other four nuts (8), lockwashers, and capscrews (12) and remove the two mounting brackets (15).

(12) Remove flexible coupling (14) from erdlator agitator shaft.

(13) Remove cover from flexible coupling (2).

(14) Loosen setscrew and remove half of the flexible coupling (2) and machine key from gear assembly input shaft (16).

(15) On units with serial numbers other than 816 thru 1083, loosen the two setscrews (17, fig. 4-82) in inner race of agitator shaft bearing (10, fig. 4-83).

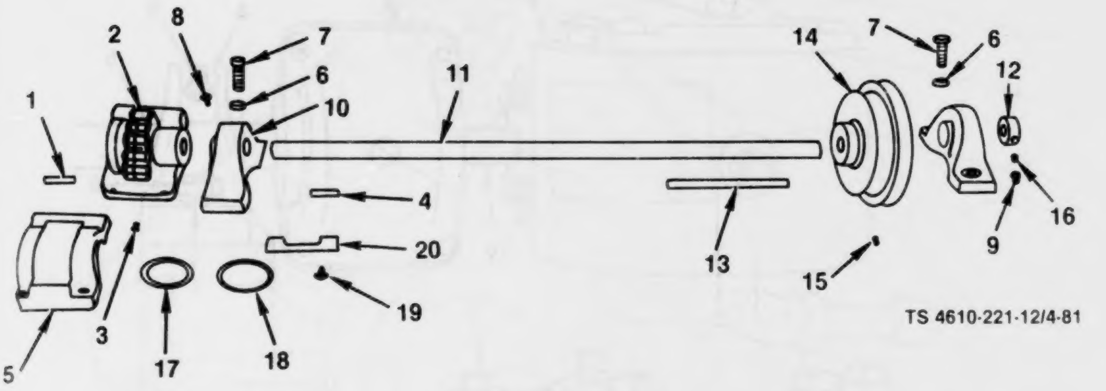


TS 4610-221-12/4-80

Figure 4-80. Agitator Motor Base, Removal

Legend for figure 4-80:

1. Screw, cap, hex-hd 3/8-16 x 1 1/4 in. (4)
2. Agitator motor base
3. Washer (4)
4. Washer (4)
5. Nut, plain, hex 3/8-16 (4)
6. Motor mount plate



TS 4610-221-12/4-81

Figure 4-81. Agitator Drive Shaft, Exploded View

Legend for figure 4-81:

1. Key, machine, 1/8 x 1 in.
2. Flexible coupling
3. Setscrew, 1/4-20 x 1/4 in. (3)
4. Key, machine, 3/16 x 1 in.
5. Flexible coupling cover
6. Washer, lock, 3/8 in. (4)
7. Screw, cap, 3/8-16 x 1 in. (4)
8. Setscrew, No. 8-32 x 5/16 in. (4)
9. Lubrication fitting, 1/4-28 (2)
10. Bearing unit (2)
11. Erdlator drive shaft
12. Collar
13. Key, machine, 3/16 x 3/16 x 4 in.
14. Pulley
15. Setscrew, 5/16-18 x 5/16 in.
16. Setscrew
17. Seal (2)
18. Washer (2)
19. Screw (4)
20. Gasket (2)

(16) Remove retaining ring (19, fig. 4-82) that secures agitator shaft (13) above the agitator shaft bearing and gently lower agitator shaft into downcomer tube.

(17) Remove four nuts, lockwashers (8, fig. 4-83) and capscrews (6) and slide agitator shaft bearing (10) off agitator shaft.

(18) Remove lubrication fitting (18, fig. 4-82) from agitator shaft bearing.

(19) On units with serial numbers 816 thru 1083 loosen two setscrews (17, fig. 4-82) in inner race of agitator shaft bearing (7, fig. 4-84).

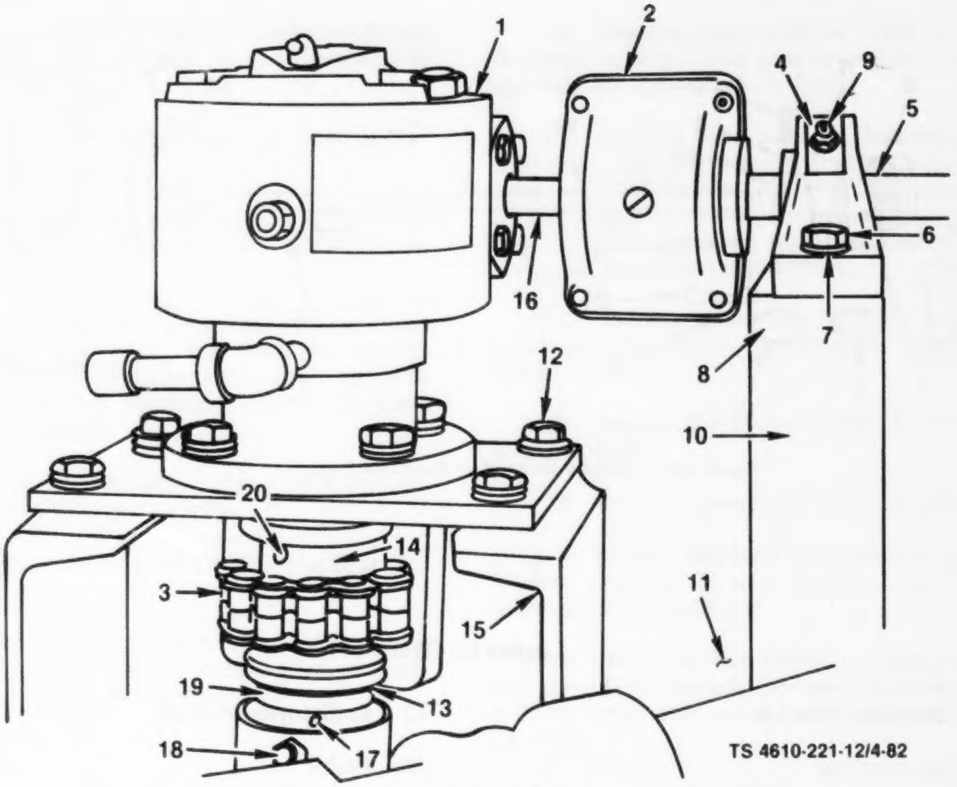
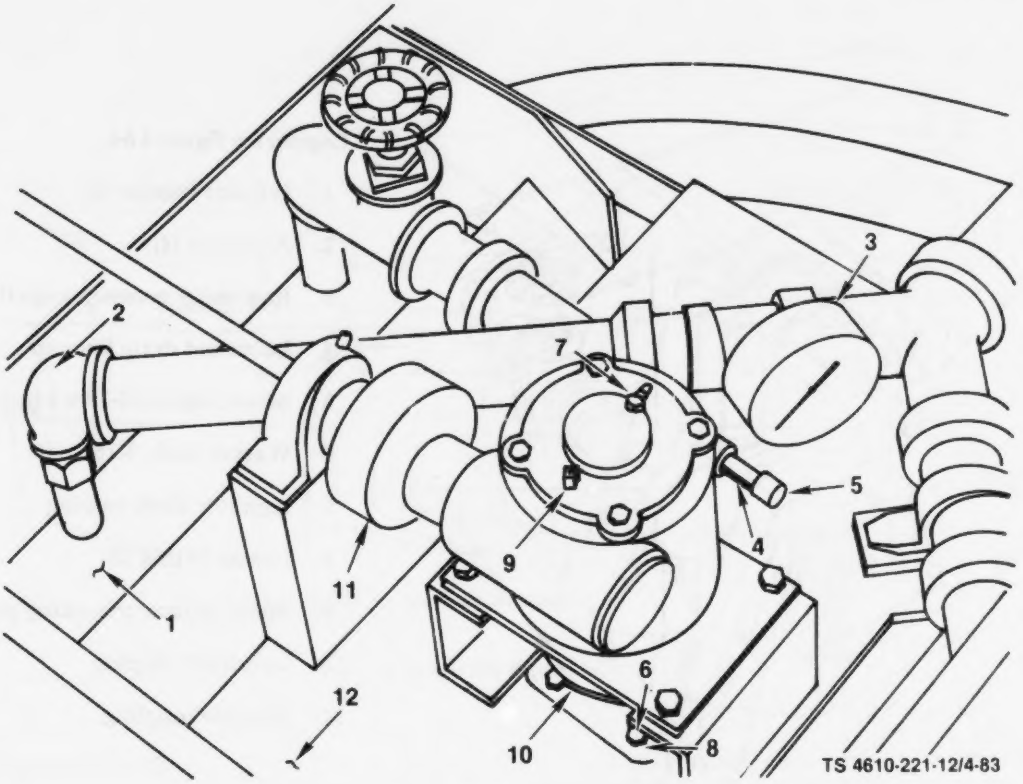


Figure 4-82. Agitator Drive Shaft and Gear Assembly, Removal

Legend for figure 4-82:

1. Erdlator agitator gear assembly
2. Flexible coupling
3. Chain flexible coupling
4. Bearing unit (2)
5. Erdlator drive shaft
6. Screw, cap, 3/8-16 x 1 in. (4)
7. Washer, lock, ET, 3/8 in. (8)
8. Nut, 3/8-16 (8)
9. Lubrication fitting
10. Mounting bracket (2)
11. Motor mount plate
12. Screw, cap, 3/8-16 x 1 in. (4)
13. Erdlator agitator shaft
14. Flexible coupling
15. Mounting bracket (2)
16. Gear assembly input shaft
17. Setscrew
18. Lubrication fitting
19. Retaining ring
20. Setscrew (2)



TS 4610-221-12/4-83

Figure 4-83. Agitator Shaft Bearing, Removal (All Units Except 816-1083)

Legend for figure 4-83:

1. Influent launder (2)
2. Aspirator (4)
3. Raw water pressure gage (PI-1)
4. Drainplug
5. Cap
6. Screw, cap, 5/16-18 x 1 in. (4)
7. Lubrication fitting
8. Washer, lock, ET, 5/16 in. (4)
9. Fill plug
10. Agitator shaft bearing
11. Flexible coupling
12. Motor mount plate

(20) Remove retaining ring (19, fig. 4-82) that secures agitator shaft (13) above agitator shaft bearing and gently lower agitator shaft into downcomer tube.

(21) Remove four nuts, lockwashers (6, fig. 4-84) and capscrews (5) and slide agitator shaft bearing (7) off agitator shaft.

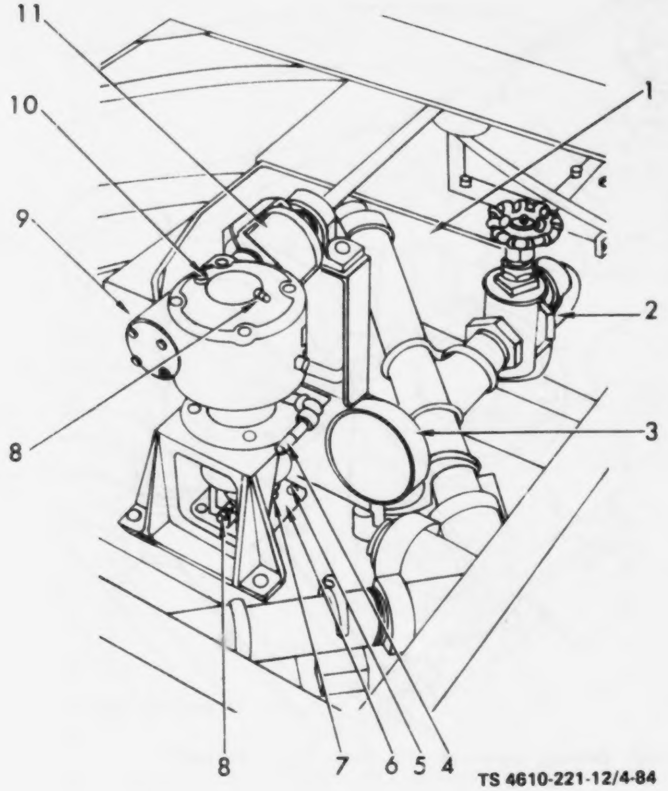
(22) Remove lubrication fitting (18, fig. 4-82) from agitator shaft bearing.

(23) Remove effluent launder rubber boot (para 4-79) and leveling rods (para 4-86).

(24) Remove influent launders (refer this to Direct Support Maintenance).

(25) Remove eight nuts (5, fig. 4-85), lockwashers (4), beveled washers (8), and screws (9) and remove two bridge rails (12) from erdlator tank.

(26) Remove four nuts (5), lockwashers (4), beveled washers (8), and screws (9) and remove rail support between bridge rails.



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Legend for figure 4-84:

1. Influent launder (2)
2. Aspirator (4)
3. Raw water pressure gage (PI-1)
4. Lubricant drain line cap
5. Screw, cap, 5/16-18 x 1 in. (4)
6. Washer, lock, 5/16 in. (4)
7. Agitator shaft bearing
8. Grease fitting (2)
9. Speed reducer mounting plate
10. Lubricant fill plug
11. Flexible coupling

Figure 4-84. Agitator Shaft Bearing, Removal

b. *Cleaning and Inspection.*

WARNING

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(1) Clean bridge rails and speed reducing mounting plate with cleaning solvent (item 1, App. E).

(2) Inspect bridge rails and mounting plate for cracks, dents, bends, and broken welds.

(3) Repair bridge rails and mounting plate by straightening dents or bends and welding cracks. Replace unserviceable parts.

c. *Installation.*

(1) Position rail support between bridge rails and secure with four screws (9), beveled washers (8), lockwashers (4), and nuts (5).

(2) Position two bridge rails (12) or erdlator tank and secure with eight screws (9), bevel washers (8), lockwashers (4), and nuts (5).

(3) Install effluent launder (refer this to Direct Support Maintenance).

(4) Install effluent launder rubber boot (para 4-79) and leveling rods (para 4-86).

(5) On units with serial numbers 816 thru 1083 install lubrication fittings (18, fig. 4-82) in agitator bearing (7, fig. 4-84).

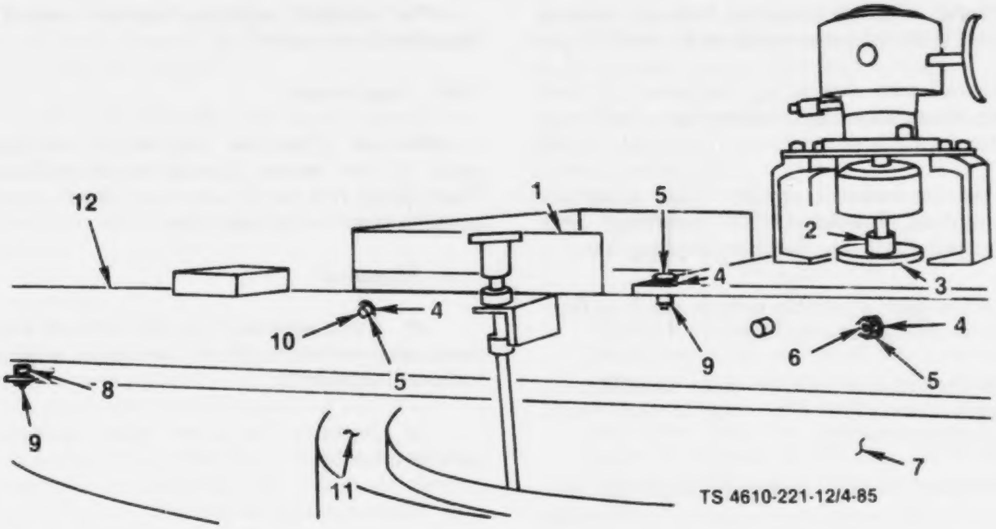

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Figure 4-85. Bridge Rails, Removal

Legend for figure 4-85:

1. Influent launder (2)
2. Agitator
3. Mounting plate
4. Washer, lock, 3/8 in. (24)
5. Nut, plain, hex, 3/8-16 &24?
6. Screw, machine, 3/8-16 x 1 1/4 in. (8)
7. Downcomer tube
8. Washer, beveled, 3/8 in. (12)
9. Screw, cap, 3/8-16 x 1 1/4 in. (8)
10. Screw, machine, pan hd, 3/8-16 x 1 1/4 in. (8)
11. Effluent launder
12. Bridge rail (2)

(6) Position agitator shaft bearing (7) over agitator shaft (13, fig. 4-82) and on mounting plate (9, fig. 4-84) and secure with four nuts, lockwashers (6), and capscrews (5).

(7) Lift agitator shaft (13, fig. 4-82) and install retaining ring (19) above agitator shaft bearing (7, fig. 4-84).

(8) Tighten two setscrews (17, fig. 4-82) to secure inner race of agitator shaft bearing (7, fig. 4-84) to agitator shaft (13, fig. 4-82).

(9) On units with serial numbers other than 816 thru 1083, install lubrication fitting (18, fig. 4-82) in agitator shaft bearing (10, fig. 4-83).

(10) Position agitator shaft bearing (10) over agitator shaft (13, fig. 4-82) and on motor mount plate (12, fig. 4-83) and secure with four nuts, lockwashers (8), and capscrews (6).

(11) Lift agitator shaft (13, fig. 4-82) and install retaining ring (19) above agitator shaft bearing (10, fig. 4-83).

(12) Tighten two setscrews (17, fig. 4-82) to secure the inner race of agitator shaft bearing (10, fig. 4-83) to agitator shaft (13, fig. 4-82).

(13) Install half of flexible coupling (2, fig. 4-82) and machine key on gear assembly input shaft (16) and secure with setscrew (20).

(14) Install cover on flexible coupling (2).

(15) Install flexible coupling (14) on erdlator agitator shaft (13) and secure with setscrew (17).

(16) Install two mounting brackets (15) and secure with four nuts (8), lockwashers, and capscrews (12).

(17) Position erdlator agitator gear assembly (1) on mounting brackets (15) inserting gear assembly output shaft into flexible coupling (14).

(18) Secure gear assembly output shaft to flexible coupling (14) with setscrew (20).

(19) Secure erdlator agitator gear assembly (1) to mounting brackets (15) with four nuts (8), lockwashers and capscrews (12).

(20) Position flexible coupling chain (3) over two halves of flexible coupling (2) and secure flexible coupling chain together with master link.

(21) Install cover on flexible coupling (14).

(22) Install two mounting brackets (10, fig. 4-82) on motor mount plate (11) and secure with four nuts (8), lockwashers (7), and capscrews (6).

(23) Install machine key (1, fig. 4-81) in gear assembly input shaft (16, fig. 4-82). Position bearing units (4) to mounting brackets (10) and, at the same time, slide flexible coupling (2) over machine key in gear assembly input shaft (16).

(24) Secure two bearing units (4) to mounting brackets (10) with two nuts (8), lockwashers (7), and capscrews (6).

(25) Pull agitator drive shaft toward erdlator agitator gear assembly (1) and secure flexible coupling (2) to gear assembly input shaft (16) with a setscrew.

(26) Tighten two setscrews (8, fig. 4-81) in each bearing unit (4, fig. 4-82) to secure bearings to erdlator drive shaft (5).

(27) Install flexible coupling cover (5, fig. 4-81) by installing washers (18), seals (17), gaskets (20) and screws (19).

(28) Position agitator motor base (2, fig. 4-80) on motor mount plate (6).

(29) Secure the back of agitator motor base (2) to motor mount plate (6) with two screws (1), washers (3 and 4) and nuts (5).

(30) Install agitator motor assembly as described in para 4-47.

4-88. Aspirators.

a. General. The four aspirators are located at ends of raw water piping above erdlator tank. They direct raw water into the influent launder and provide aeration of raw water.

b. Removal.

(1) Turn aspirator (2, fig. 4-83 or 4-84) clockwise, unscrewing it from raw water piping above influent launder (1).

(2) Remove the three other aspirators in a similar manner.

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash p-oint of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean aspirators with cleaning solvent (item 1, App. E) and dry thoroughly. Be sure aeration holes in the aspirator are free of mineral deposits. A wire brush may be used to aid cleaning.

(2) Replace a damaged or defective aspirator.

d. Installation.

(1) Install aspirator (2, fig. 4-83 or 4-84) on end of raw water piping above influent launder (1) by turning it counterclockwise.

(2) Install the three other aspirators in a similar manner.

4-89. Low Water Level Float Valve.

a. General. The float bypass valve, located in raw water piping above the erdlator tank, is regulated by low water level alarm assembly depending upon level of water in wet well tank.

b. Removal.

(1) Loosen thumbscrew (1, fig. 4-47) and remove float rod (2) with attached float from float rod connector (3) and wet well tank (14).

(2) Remove two cotter pins (6). Remove two lever pins (5) and remove low water level alarm assembly (4) from float valve (7).

(3) Disconnect nearest slip joint connector and pipe union and remove section of raw water piping containing float valve (7).

(4) Remove raw water piping and valves from float valve (7).

c. *Disassembly.*

(1) Loosen locknut (14, fig. 4-86) and remove valve lifter (15) and locknut (14) from end of valve rod (7) which protrudes through packing nut (13).

(2) Remove two cotter pins (16) and lever pin (17) and separate connecting link (18) from clevis (11).

(3) Remove packing nut (13) and valve locknut (12) and remove clevis (11) from bonnet (8).

(4) Remove bonnet (8), with attached parts, from body (1).

(5) Remove valve rod (7), with attached parts, from bonnet (8) and remove packing retainer (10) and preformed packing (9) from bonnet.

(6) Remove disk follower (2) and remove valve disk (3), piston (4), packing cup (5), and cup follower (6) from valve rod (7).

d. *Cleaning and Inspection.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of bypass valve with cleaning solvent (item 1, App. E). Do not clean packing cup or preformed packing with solvents, but use a solution of soap and warm water. A wire brush may be used to aid removal of mineral deposits from metal parts.

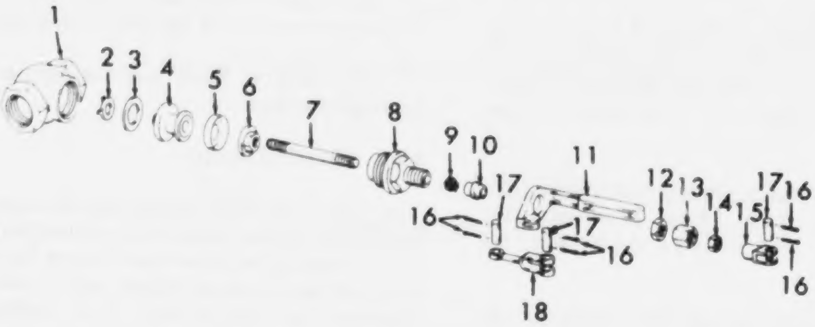

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Figure 4-86. Low Water Level Float Valve, Exploded View

Legend for figure 4-86:

1. Body
2. Disk follower
3. Valve disk
4. Piston
5. Packing cup
6. Cup follower
7. Valve rod
8. Bonnet
9. Preformed packing
10. Packing retainer
11. Clevis
12. Valve locknut (spec)
13. Packing nut (spec)
14. Locknut (spec)
15. Valve lifter
16. Pin, cotter, 1/16 x 1/2 in. (6)
17. Lever pin (2)
18. Connecting link

(2) Inspect body and bonnet for cracks, breaks, and damaged threads. Replace or repair bonnet or body if damaged or defective.

(3) Inspect valve disk and piston for deep grooves, cracks, and pits. Replace a defective valve disk or piston.

(4) Inspect valve rod for distortion and damaged threads. Replace a damaged or defective valve rod.

(5) Inspect clevis and connecting link for cracks and breaks. Replace damaged or defective parts.

e. *Reassembly.*

(1) Install cup follower (6, fig. 4-86) packing cup (5), piston (4), and valve disk (3) on valve rod (7) and secure with disk follower (2).

(2) Insert valve rod (7), with attached parts, into bottom of bonnet (8) and install bonnet, with valve rod and attached parts, in body (1).

(3) Position clevis (11) on bonnet and secure with locknut (12).

(4) Install preformed packing (9) and packing retainer (10) in bonnet (8) around valve rod (7). Install packing nut on bonnet and tighten it down securely, but not enough to completely crush valve packing.

(5) Position connecting link (18) in clevis (11), aligning pin holes in each. Insert lever pin (17) through aligned holes and install a cotter pin (16) in each end of lever pin.

(6) Install locknut (14) and valve filter (15) on end of valve rod (7) and tighten locknut against valve lifters to secure.

f. *Installation.*

(1) Install raw water piping and valves to each side of float valve (7, fig. 4-47).

(2) Install section of raw water piping containing float valve (7), and connect nearest slip joint connector and pipe union.

(3) Position low water level alarm assembly (4) on float valve (7) and retain with two lever pins (5). Secure two lever pins with cotter pins (6).

(4) Insert float rod (2) through slotted extension of wet well tank (14) and into float rod connector (3). Secure float rod within float rod connector by tightening thumbscrew (1).

(5) Adjustment of low water level alarm assembly will be made during operation (see para 2-5b. (4)).

4-90. Low Water Level Alarm Float.

a. *Removal.*

(1) Loosen thumbscrew (1, fig. 4-47) and remove float rod (2) with attached float from float rod connector (3).

(2) Loosen nut (8, fig. 4-87) and unscrew float (9) from float rod (7).

b. *Cleaning and Inspection.*

(1) Wash rubber float thoroughly.

(2) Inspect rubber float for damaged threads, cracks, and breaks that will permit float to leak. Replace rubber float if it leaks or is damaged.

c. *Installation.*

(1) Thread float (9, fig. 4-87) onto float rod (7) and tighten nut (8).

(2) Insert float rod (2, fig. 4-47) through float rod connector (3) and tighten thumbscrew (1).

(3) Adjust float rod for proper water level during operation.

4-91. Plastic Tubing.

a. *General.* This paragraph contains information on plastic tubing used in the water purification unit. If any tubing is defective it must be replaced with new tubing of same length and inside and outside diameter as old tubing. New tubing should be obtained from bulk stock. Use old piece of tubing as a pattern for required length when cutting new tubing.

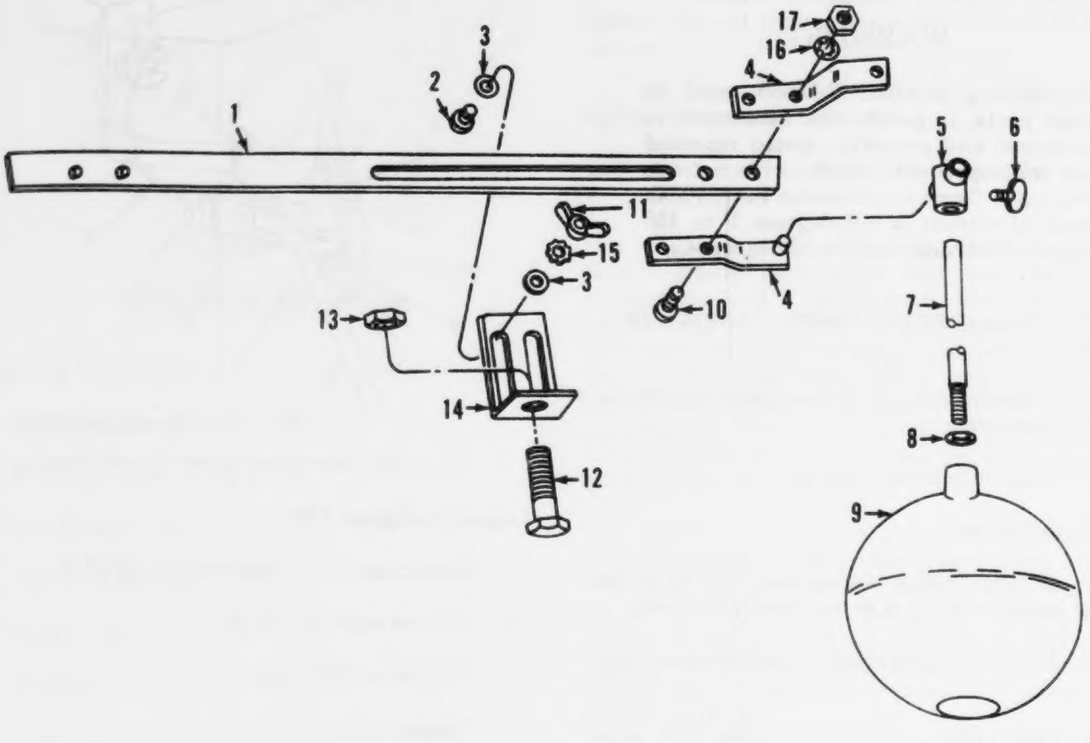
b. *Removal.*

(1) Loosen screws in tubing clamp, slide tubing from connector, and slide tubing clamp off tubing.

(2) Remove tubing holddown clamps and lift tubing from equipment.

NOTE

Save undamaged clamps for installation of new tubing.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TS 4610-221-12/4-87

Figure 4-87. Low Water Level Alarm Assembly, Exploded View

Legend for figure 4-87:

1. Float lever
2. Screw, cap, hex-hd, 1/4-20 x 1 in. (2)
3. Washer, flat, 1/4 in. (4)
4. Fork
5. Float rod connector
6. Thumbscrew, 1/4-20 x 1/2 in.
7. Float rod
8. Nut, hex, 1/4-20
9. Rubber float, 6 in. dia.
10. Screw, 1/4-20 x 1 in. (2)
11. Wingnut, 1/4-20 (2)
12. Screw, cap, hex-hd, 5/8-18 x 2 1/2 in.
13. Nut, hex, 5/8-18
14. Bracket
15. Washer, lock, ET, 1/4 in. (2)
16. Washer, lock, 9/32 ID x 3/4 OD
17. Nut, 1/4 x 20

c. Clean, Inspect, and Replace.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean tubing with cleaning solvent (item 1, App. E).

(2) Inspect tubing for cracks, scale accumulation, and deterioration.

(3) Replace defective tubing.

d. Installation.

(1) If new tubing is required, cut it to the required length making sure walls are cut square.

(2) Blow through tubing to be sure opening is clear.

(3) Slide tubing clamps on tubing, then slide tubing on connectors and secure it with tubing clamps.

4-92. Slurry Ejector Assembly.

a. General. The ejector is located on the right side of slurry feeder assembly and ejects limestone slurry from slurry feeder tank for delivery to erdlator tank.

b. Removal.

(1) Loosen pipe bushing (6, fig. 4-88) and disconnect plastic tube (8) from ejector (5).

(2) Loosen tube nut (3) that secures copper tube (4) to ejector (5) and disconnect copper tube.

(3) Remove ejector (5) from slurry feeder assembly (7).

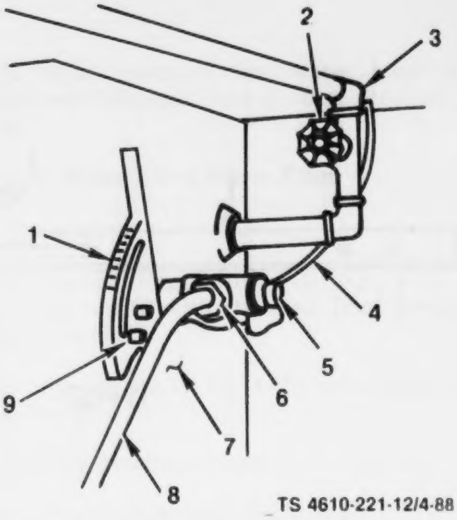

Figure 4-88. Slurry Feed Variator Ejector, Removal

Legend for figure 4-88:

1. Limestone slurry feed variator (FEI-6)
2. Control valve & (CV-8)
3. Nut, tube, 3/8 in. (2)
4. Copper tube
5. Ejector
6. Bushing, pipe, 1/2 x 1 in.
7. Slurry feeder assembly
8. Plastic tube
9. Knob, locking

c. Disassembly.

(1) Remove pipe-to hose adapter (1, fig. 4-89) and pipe bushing (2) from pipe cross (3).

(2) Remove pipe plug (9) and plug nipple (4) from pipe cross.

(3) Remove pipe-to-tube connector (8) from pipe coupling (7) and remove pipe coupling, with attached parts, from pipe cross (3).

(4) Remove pipe nipple (5) and pipe bushing (6) from coupling (7).

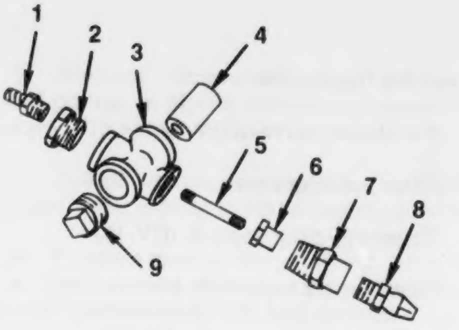

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Figure 4-89. Ejector, Exploded View

Legend for figure 4-89:

1. Adapter, pipe-to-hose, 1/2 in.
2. Bushing, pipe, 1/2 in. x 1 in.
3. Cross, pipe, 1 in.
4. Nipple, pipe, 1 in.
5. Nipple, pipe 1/8 x 1 1/2 in.
6. Bushing, pipe, 1/8 x 1/2 in.
7. Coupling, pipe 1/2 x 1/2 x 1 in.
8. Connector, 3/8 in. brass tube to 1/2 in. male pipe
9. Plug, pipe 3/4 x 1 in.

e. Reassembly.

(1) Install pipe bushing (6, fig. 4-89) in pipe coupling (7) and pipe nipple (5) in pipe bushing.

(2) Install pipe coupling (7) in pipe cross (3) and install pipe-to-tube connector (8) in pipe coupling.

(3) Install pipe nipple (4) and pipe plug (9) in pipe cross.

(4) Install pipe bushing (2) in pipe cross and install pipe-to-hose adapter (1) in pipe bushing (2).

f. Installation.

(1) Install ejector (5, fig. 4-88) on right side of slurry feeder assembly (7).

(2) Connect loose end of copper tube (4) to ejector (5) and tighten tube nut (3) on that end to secure.

(3) Connect plastic tube (8) to ejector (5) and tighten hose clamp to secure.

4-93. Gate Valves, Check Valves, and Pipe Fittings.

a. General. This paragraph contains information on piping, gate valves, and check valves used throughout water purification unit. Since it is impractical to describe each pipeline, gate valve, and check valve individually, this section contains basic information only. When pipe fittings, gate valves, and check valves are defective, obtain new components from bulk stock and use old pipe fittings, gate valves, and check valves as a pattern to prepare a new pipeline.

b. Removal. Remove a section of damaged or clogged piping or a defective gate or check valve by removing all clamps or holddown devices that secure piping. Disconnect pipe unions nearest section of defective piping and gate or check valve and remove section of piping from piping assembly. Piping may be removed as individual pieces rather than in sections.

c. Cleaning and Inspection. Clean piping, check valves, and gate valves with drycleaning solvent. Wash cleaning solvent from piping, gate valves, fand check valves with a solution of soap and warm water and rinse thoroughly. Inspect piping for cracks, damaged threads, corrosion, rust, and an accumulation of mineral deposits. Inspect mechanical operation of gate valves. Mineral deposits and rust may be removed from within piping and valves with a stiff wire brush. Replace all defective or inoperative gate valves, check valves, and pipe fittings.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 C to 59 degrees C).

d. Installation. Install individual pieces of piping, gate valves, and check valves in the same order and location from which old piping, gate valves, and check valves were removed. Install sections of piping in same location of piping assembly from which they were removed and secure each end of the section of piping with the pipe union. Secure piping in place with clamps or hold-down devices that previously secured old piping.

4-94. Three-Way Plug Valve (Coagulated Water).

a. General. The coagulated water three-way plug valve is located in the coagulated water piping to the left of diatomite filter assembly. It directs flow of coagulated water to the influent section of the diatomite filter assembly for filtering or to wash ring of diatomite filter assembly for flushing lower filter shell.

b. Removal.

(1) Remove four nuts (9, fig. 4-68), lock-washers (12), and capscrews (10) and separate pre-coat funnel (11) from filter housing (8).

(2) Remove precoat funnel (11) from coagulated water piping to three-way plug valve.

(3) Disconnect pipe unions and slip joint couplings that connect piping to three-way plug valve (3, fig. 4-90) and remove three-way plug valve with attached piping.

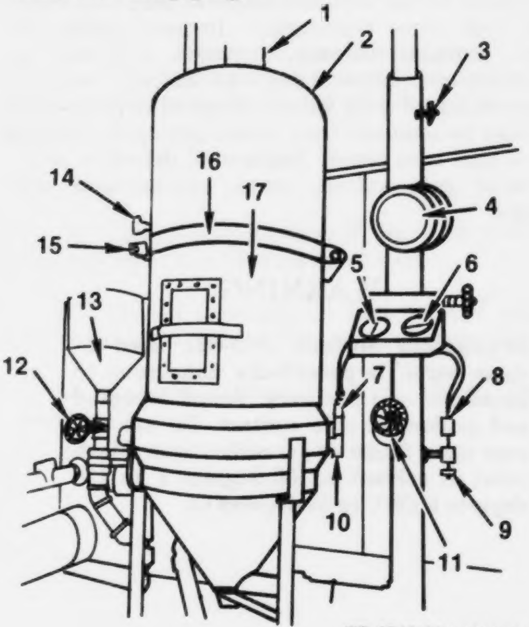

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Figure 4-90. Three-Way Plug Valve, Removal

Legend for figure 4-90:

1. Air release valve (ARV-49)
2. Filter housing cover
3. Three-way plug valve & (CV-46)
4. Flow control valve (CV-45)
5. Influent pressure gauge (PI-2)
6. Effluent pressure gauge (PI-3)
7. Plug cock (DC-41)
8. Plug cock (DC-43)
9. Draincock & (DC-44)
10. Draincock (DC-42)
11. Control valve (CV-40)
12. Control valve (CV-37)
13. Precoat funnel
14. Control valve (CV-38)
15. Screw, cap, 5/8-18 x 6 in. (2)
16. Clamp assembly (2 parts)
17. Filter housing.

(4) Remove all pipe fittings from three-way plug valve (3).

c. Cleaning and Inspection.

(1) Clean three-way plug valve inside and out with a solution of soap and warm water. Thoroughly rinse three-way plug valve to be sure that all soap film has been removed.

(2) Inspect three-way plug valve for cracks, breaks, evidence of water leaks, and damaged threads. Examine mechanical action of three way plug valve. Replace a damaged or defective three-way plug valve.

d. Installation.

(1) Install all pipe fittings on three-way plug valve in a similar pattern to that from which they were removed.

(2) Position three-way plug valve, with attached piping, in piping system and connect pipe unions and slip joint couplings.

(3) Install precoat funnel (11, fig. 3-68) on coagulated water piping to three-way plug valve.

(4) Position precoat funnel (3, fig. 3-90) on left side of filter housing (8) and secure with four capscrews (10), lockwashers (12), and nuts (9).

(5) Lubricate three-way plug valve in accordance with current lubrication order.

NOTE

The three-way plug valve does not require lubrication for ETC Model S1500, Nos. S1500-1 through S1500-50.

4-95. Flow Control Valve.

a. General. The flow control valve is located in filtered water piping on the effluent side of diatomite filter. The flow control valve regulates flow of water through diatomite filter assembly at a rate of 0 to 30 gallons (0 to 11.8 liters per minute).

b. Removal.

(1) Separate two pipe unions (1, fig. 4-91) and remove flow control valve (9) from filtered water piping.

(2) Remove the two halves of pipe unions (1) from close nipple (10) in inlet and outlet sides of flow control valve and remove pipe nipples from flow control valve.

c. Cleaning and Inspection.

(1) Clean flow control valve inside and out with a solution of soap and warm water. Thoroughly rinse flow control valve to be sure that all soap film has been removed.

(2) Inspect flow control valve for cracks, breaks, evidence of leaking, and improper operation. Replace a damaged or defective flow control valve.

d. Installation.

(1) Install two pipe nipples in inlet and outlet sides of flow control valve. Install the two halves of pipe union (1, fig. 4-91) on close nipple (10).

(2) Position flow control valve (9) in filtered water piping and connect two pipe unions (1).

4-96. Three-Way Plug Valve (Filtered Water).

a. General. The filtered water three-way plug valve is located in filtered water piping above flow control valve. It directs flow of filtered water to storage tanks outside of the van body or recirculates water to wet well tank for refiltering.

b. Removal.

(1) Disconnect pipe union (3, fig. 4-91) and remove pipe nipple (4) with attached half union from elbow.

(2) Remove pipe elbow (5) with attached nipple from the other pipe elbow.

(3) Disconnect two pipe unions (1) above and below three-way plug valve (11) and swing three-way plug valve to right, away from diatomite filter.

(4) Turn three-way plug valve (11) counterclockwise and remove it from pipe nipple (7).

(5) Remove the two halves of pipe unions from close nipples (10) and remove nipples from three-way plug valve.

c. Cleaning and Inspection.

(1) Clean three-way plug valve inside and out with a solution of soap and warm water. Thoroughly rinse three-way plug valve to be sure that all soap film has been removed.

(2) Inspect three-way plug valve for cracks, breaks, evidence of water leaks and damaged threads. Examine mechanical action of the three-way plug valve. Replace a damaged or defective three-way plug valve.

d. Installation.

(1) Install two close nipples (10, fig. 4-91) in three-way plug valve (11) and install a half of the pipe union (1) on nipple (10).

(2) Install three-way plug valve (11) on pipe nipple (7).

(3) Swing three-way plug valve (11) back into place so that it aligns with filtered water piping. Connect the two pipe unions (1).

(4) Install pipe nipple, with attached elbow (5), in other pipe elbow (5).

(5) Install pipe nipple (4), with attached pipe union (3), in pipe elbow (5). Connect pipe union (3).

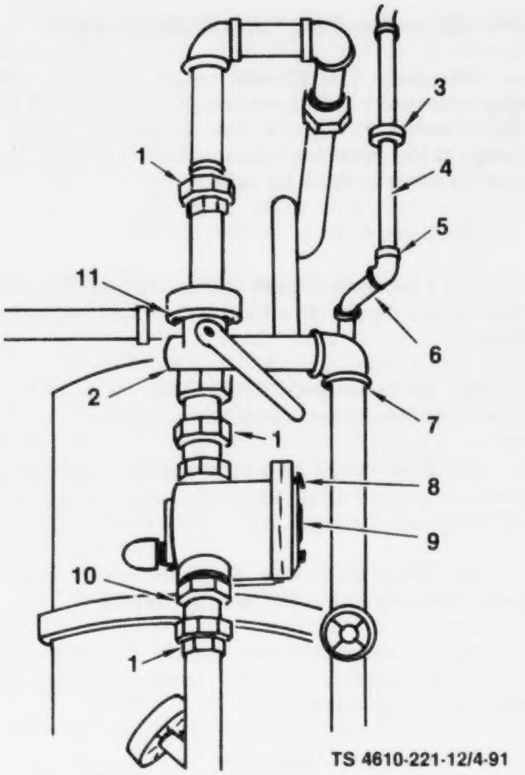

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Figure 4-91. Flow Control Valve, Removal

Legend for figure 4-91:

1. Union, pipe, 1 1/2 in. (3)
2. Instruction plate
3. Union, pipe, 1/2 in.
4. Nipple, pipe, 1/2 x 3 in.
5. Elbow, pipe, 90 degree, 1/2 in. (2)
6. Nipple, pipe, 1/2 x 1 1/2 in.
7. Nipple, pipe, 1 1/2 x 3 in.
8. Draincock, 1/4 in.
9. Flow control valve
10. Nipple, close, 1 1/2 x 2 in (3)
11. Valve, plug, 3-way, 2-port, 1 1/2 in.

(6) Lubricate three-way plug valve as directed in current lubrication order.

NOTE

The three-way plug valve does not require lubrication for ETC Model S1500, Nos. S1500-1 through S1500-50.

4-97. Air Release Valve and Gasket.

WARNING

Air that is released from the pressure valve can cause serious injury to personnel standing too close.

a. General. The air release valve is located on top of the diatomite filter assembly. It releases air trapped in filter housing cover of effluent side of filter element. When air release valve is open, air pressure trapped in filter housing cover is suddenly released, allowing air in filter element air traps to expand with effect of a blast which knocks diatomaceous earth and foreign matter off filter element for backwashing.

b. Removal. Remove six capscrews (4, fig. 4-92) and lockwashers (3) and remove air release valve (1) and gasket (5) from filter housing cover (2).

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean air release valve with cleaning solvent, (item 1, App. E), and dry thoroughly.

(2) Inspect air release valve for cracks, breaks, dents, and loose pipe fittings. Inspect operation of air release valve. Tighten loose pipe connections and replace air release valve it if is damaged or defective.

(3) Inspect gasket for cracks, breaks, or other damage. Replace gasket if damaged.

d. Installation. Position gasket (5, fig. 4-92) and air release valve (1) on filter housing cover (2) and secure with six lockwashers (3) and capscrews (4).

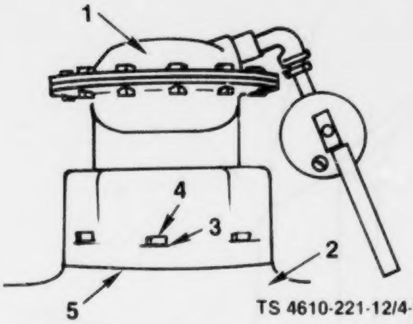

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Figure 4-92. Air Release Valve, Removal

Legend for figure 4-92:

1. Air release valve
2. Filter housing cover
3. Washer, lock, 3/8 in. (6)
4. Screw, cap, 3/8-16 x 3/8 in (6)
5. Gasket

4-98. Chain Guard.

a. *General.* The drive chain is protected by a metal chain guard that has two openings for access to slip clutch lubrication fitting and chain tightener lubrication fitting.

b. *Removel.* Remove four lockwashers (1, fig. 4-93) and four capscrews (2) and remove guard (3) from chemical slurry feeder tank (9) and frame (7).

c. *Cleaning and Inspection.*

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean chain guard with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect chain guard for damage and distortion.

(3) Replace chain guard if damaged beyond repair.

d. *Installation.*

(1) Position guard (3, fig. 4-93) over chain with its mounting holes aligned with frame (7) and chemical slurry feeder tank (9).

(2) Secure guard with four lockwashers (1) and capscrews (2).

4-99. Speed Reducer Gear Assembly.

a. *Removal.*

(1) Remove drive chain guard (para 4-98) and drive chain (para 4-102).

(2) Remove three screws (4, fig. 4-94) and washers (3) and lift guard (1) out of frame (5).

(3) Loosen screws (5, fig. 4-95) and slide slurry feeder drive motor (3) toward speed reducer drive pulley (1).

(4) Remove drivebelt (2) from pulleys (1 and 4).

(5) Remove four nuts (6, fig. 4-93), washers (4) and screws (5) and lift speed reducer (8) from its mounting.

NOTE

If speed reducer is to be replaced, retain pulley, sprocket, and key for installation on replacement speed reducer.

b. *Disassembly.*

(1) Remove 12 screws (1, fig. 4-96) and washers (2) that secure side covers (14 and 20) to housing (9).

(2) Pry covers loose and remove them from housing.

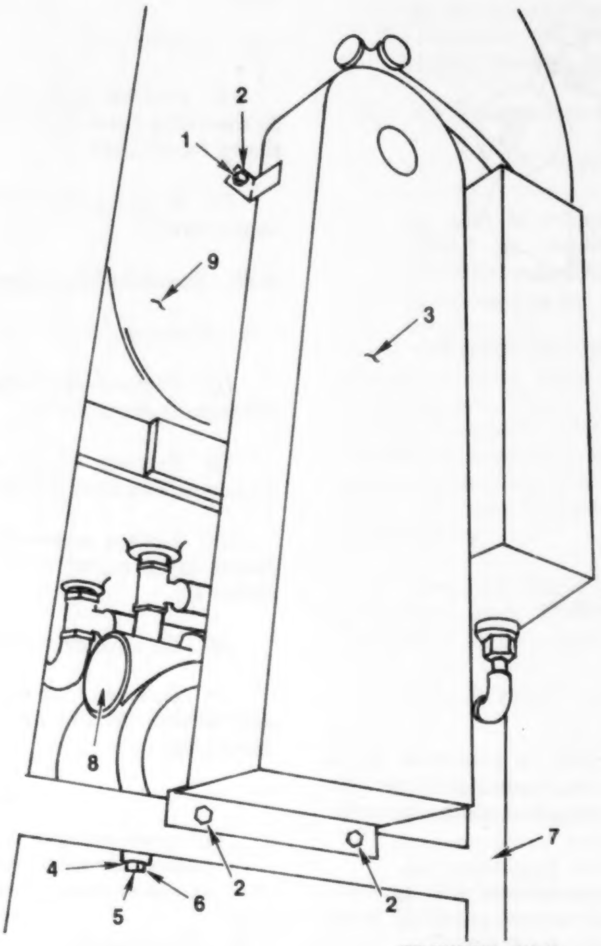
(3) Remove oil seal (21).

(4) Remove side cover gaskets (13).

(5) Remove bearing cup (12), bearing cone (11), and spacer (10) from shaft (19) on both sides of housing (9).

(6) Remove cap (16) and cap (4) from sides of housing by removing eight screws (1) and washers (2).

(7) Remove gaskets (5).



TS 4610-221-12/4-93

Figure 4-93. Chain guard, Removal

Legend for figure 4-93:

1. Washer, lock, 1/4 in. (4)
2. Screw, cap, hex. hd. 1/4-20 x 1/2 in (4)
3. Guard
4. Washer, lock 5/16 (4)
5. Screw, cap, hex hd., 5/16-18 1 in. (4)
6. **Nut, hex. 5/16-18 (4)**
7. **Frame**
8. **Chemical slurry speed reducer**
9. **Chemical slurry feeder tank**

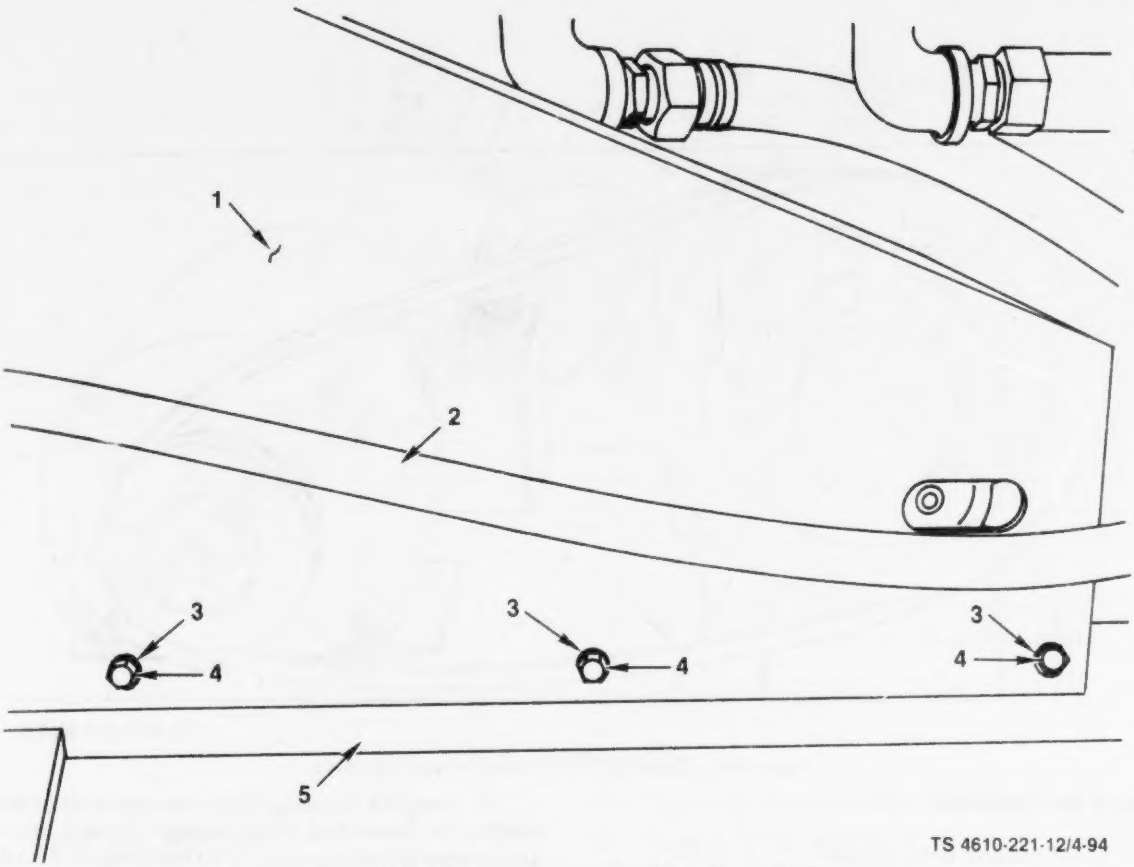


Figure 4-94. Chemical Slurry Feeder Drive Motor Guard

Legend for figure 4-94:

1. Guard
2. Hose, plastic
3. Washer, lock, split, 1/4 in. (3)
4. Screw, cap, hex-hd 1/4-20 1 in. (3)
5. Frame

(8) **Remove bearing cup (6) and bearing cone (7) from both sides of shaft (15).**

(9) **Remove shaft (15) from housing by turning it counterclockwise.**

(10) **After shaft (15) is removed, shaft (19) can be removed.**

(11) **Gear (18) can be removed from shaft (19) by removing key (22).**

c. *Cleaning and Inspection.*

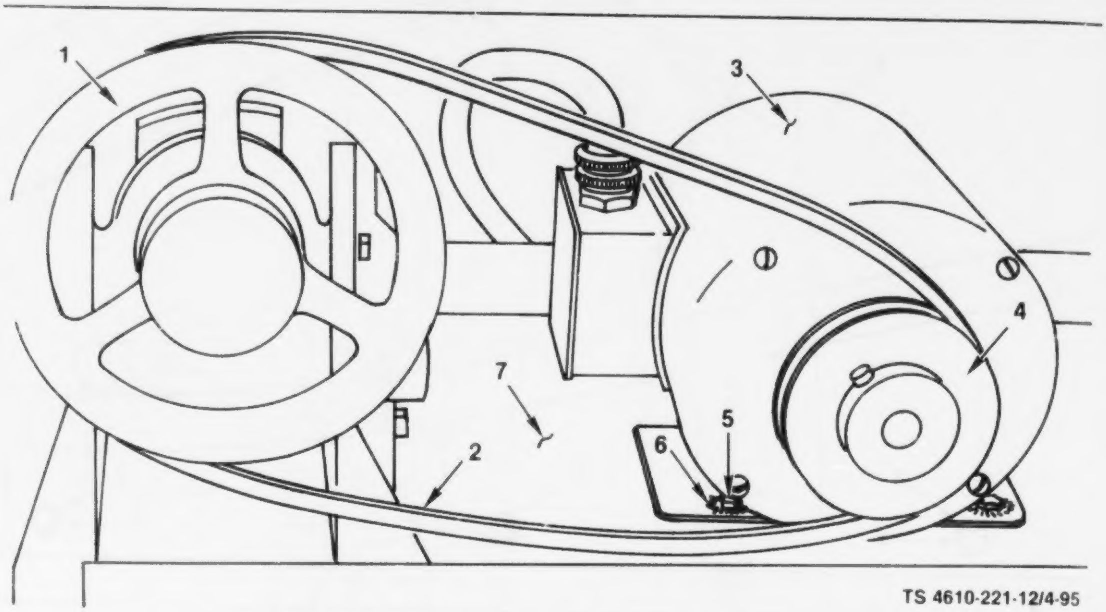
WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all metal parts in cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect input and output shaft seals for wear, deterioration, bent or distorted casings, and other damage. Replace defective seals.

(3) Inspect bearings for corroded or pitted surfaces and wear. Revolve the bearings by hand and check for rough spots. Replace defective bearings.



TS 4610-221-12/4-95

Figure 4-95. Chemical Slurry Feeder Drivebelt, Removal

Legend for figure 4-95:

1. Speed reducer drive pulley
2. Drivebelt
3. Slurry feeder drive motor
4. Motor drive pulley
5. Screw, cap, hex, 5/16-66 1 in. (4)
6. Washer, lock, ext. tooth, 5/16 in. (8)
7. Chemical feed equipment frame shelf

(4) If seals and bearings are in serviceable condition, cover them with a thin coat of light oil and wrap them in a lint-free cloth or waxed paper.

(5) Inspect gear and worm for cracked or broken teeth and worn keyways. Replace gear and worm as a set if either one has cracked or broken teeth.

(6) Inspect shafts for damaged threads, worn keyways, misalignment, and cracks. Replace shafts if they are bent or keyways or threads are worn.

(7) Inspect housing, side covers, and bearing adapter for cracks and other damage. Replace housing and covers if threads cannot be restored or if part is cracked or broken.

(8) Replace all unserviceable mounting hardware.

(9) Replace all gaskets.

d. Reassembly.

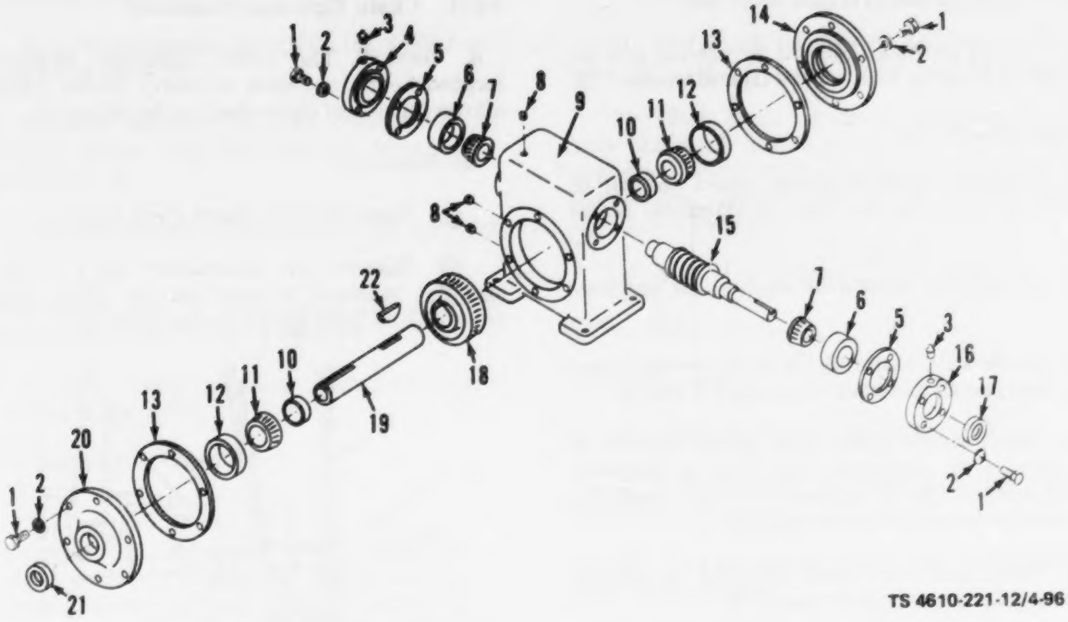
(1) Insert key (22, fig. 4-96) into shaft (29) and slide gear (18) onto shaft.

(2) Insert shaft (19) with gear (18) into housing (9) and insert shaft (15) into housing and turn shaft (15) clockwise to engage it with gear (18).

(3) Install bearing cone (7) and bearing cup (6) onto both sides of shaft (15).

(4) Install spacer (10), bearing cone (11) and bearing cup (12) on both sides of shaft (19).

(5) Install gasket (5) and caps (4 and 16) on sides of housing (9) with screws (1) and washers (2).



TS 4610-221-12/4-96

Figure 4-96. Slurry Feeder Gear Assembly, Exploded View

Legend for figure 4-96:

1. Screw, cap, hex hd. (20)
2. Washer, lock, split (20)
3. Fitting, lube (2)
4. Cap, closed, high speed
5. Gasket, cap, high speed (2)
6. Cup, bearing, roller, high speed (2)
7. Cone, bearing, roller, high speed (2)
8. Plug, pipe (3)
9. Housing, reducer
10. Spacer, slow speed (2)
11. Cone, bearing, roller, slow speed (2)
12. Cup, bearing, roller, slow speed (2)
13. Gasket, cover, slow speed (2)
14. Cover closed, slow speed
15. Shaft, worm, int, high speed
16. Cap, open, high speed
17. Seal, oil, high speed
18. Gear, worm, bronze, slow speed
19. Shaft, single ext., slow speed
20. Cover, open
21. Seal, oil, slow speed
22. Key, Woodruff

(6) Install oil seal (21) into cover (20).

(7) Install gaskets (13) and covers (14 and 20) onto sides of housing with screws (1) and washers (2).

e. *Installation.*

(1) Position chemical slurry speed reducer (8, fig. 4-93) in place on the floor of chemical feeder frame.

(2) Install four screws (5), washers (4), and nuts (6).

(3) Move drive motor (3, fig. 4-95) toward speed reducer and install drivebelt on pulleys (1 and 4).

((4) Move motor away from speed reducer to apply tension to drivebelt. The belt is correctly adjusted when is can be depressed 1/2 to 1 inch at a point midway between the two pulleys.

(5) When belt has been adjusted to correct tension, tighten nuts on four screws (5).

(6) Position guard (1, fig. 4-94) on frame (5) and secure it with three screws (4) and washers (3).

(7) Install drive chain (para 4-102) and drive chain guard (para 4-98).

4-100. Key, Sprocket and Pulley.

a. *Removal.*

(1) Refer to paragraph 4-99 and perform removal procedure for speed reducer.

(2) Remove sprocket, pulley, and keys from speed reducer.

b. *Inspection.*

(1) Inspect sprocket, pulley and keys for burrs, cracks or other damage.

(2) Replace damaged sprocket, pulley, or keys.

c. *Installation.*

(1) Install sprocket, pulley, and keys on speed reducer and tighten to shafts.

(2) Refer to paragraph 4-99 and perform speed reducer installation procedure as outlined.

4-101. Chain Tightener Assembly.

a. *General.* The chain tightener assembly is located near the center of slurry feeder frame and allows tension of drive chain to be adjusted.

b. *Removal.*

(1) Remove chain guard (para 4-98).

(2) Remove nut, lockwasher, bolts (7, fig. 4-97) and flat washers (8) and remove chain tightener assembly (2) from slurry feeder frame (6).

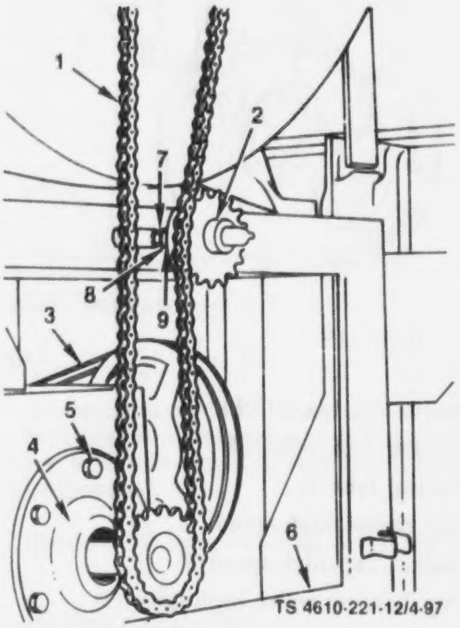


Figure 4-97. Chain Tightener Assembly, Removal

Legend for figure 4-97:

1. Drive chain
2. Chain tightener assembly
3. V-belt
4. Slurry feeder gear assembly.
5. Screw, cap, 3/8-16 1 1/4 in. (6)
6. Slurry feeder frame
7. Nut, hex, 1/2-13
8. Washer, flat, 0.521-0.541 I.D. x 1.062 O.D. (2)
9. Washer, lock, 1/2 in.

c. Disassembly.

(1) Remove lubrication fitting (7, fig. 4-98) from chain tightener shaft (3).

(2) Remove setscrew (8) from shaft collar (6) and remove collar and sprocket (5) from chain tightener shaft (3).

(3) Remove sprocket bearing (4) from sprocket (5).

(4) Remove nut (9), lockwasher (1), and flat washer (2) from chain tightener shaft (3).

(5) Remove chain tightener shaft from slurry feeder frame (6, fig. 4-97).

d. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of chain tightener assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect chain tightener bracket, shaft collar, and chain tightener shaft for cracks, breaks, distortion, and damaged screw threads. Clean lubrication hole through chain tightener shaft. Replace any defective or unserviceable part.

(3) Inspect sprocket for cracked, broken, or distorted teeth. Inspect sprocket bearing for excessive and uneven wear. Replace sprocket bearing if defective.

e. Reassembly.

(1) Install chain tightener shaft (3, fig. 4-98) in slurry feeder frame (6, fig. 4-97) and secure with flat washer (2, fig. 4-98), lockwasher (1) and nut.

(2) Install sprocket bearing (4) in sprocket (5).

(3) Position sprocket (5) and shaft collar (6) on chain tightener shaft (3) and secure collar with setscrew (8).

(4) Install lubrication fitting (7) in chain tightener shaft and lubricate.

f. Installtion.

(1) Install chain tightener and fasten with lockwashers (9, fig. 4-97), flat washers (8), and nut (7).

(2) Move chain tightener assembly (2) toward drive chain (1), meshing the teeth of the sprocket with drive chain until all of the slack is out of the drive chain. Tighten nut (7) to secure the chain tightener assembly.

(3) Install chain guard (para 4-98).

4-102. Drive Chain.

a. Removal.

(1) Remove chain guard (para 4-98).

(2) Loosen nut (7, fig. 4-97) to relieve tension on drive chain (1).

(3) Remove master link from drive chain and remove drive chain.

b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean drive chain with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect chain for cracked, broken or weakened links and for kinks.

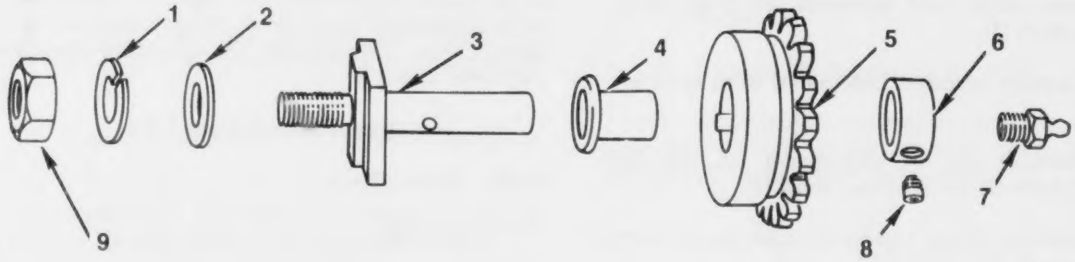
(3) Replace damaged links with master links. Replace drive chain if damaged beyond repair.

(4) Coat drive chain with lubricating oil.

c. Installation.

(1) Install drive chain (1, fig. 4-97) and fasten ends together with master link.

(2) Move chain tightener assembly (2) toward drive chain (1), meshing teeth of sprocket with drive chain until all slack is out of drive chain. Tighten nut (7) to secure the chain tightener assembly.



TS 4610-221-12/4-98

Figure 4-98. Chain Tightener Assembly, Exploded View

Legend for figure 4-98:

1. Washer, lock, 1/2 in.
2. Washer, 0.521-0.541 id x 1.062 od
3. Chain tightener shaft
4. Sprocket bearing
5. Sprocket, 18 teeth, 5/8 in. bore
6. Shaft collar, 5/8 in.
7. Lubrication fitting, 1/8 in.
8. Setscrew, 1/4-20 x 1/4 in.
9. Nut, hex, 1/2-13

(3) Install chain guard (para 4-98).

4-103. Slip Clutch Assembly.

a. General. The slip clutch assembly is located on the drive end of slurry feeder agitator shaft. It protects slurry feeder drive shaft when an overload or clogged condition exists within the slurry feeder assembly, by allowing slip clutch assembly to disengage and drive to turn freely.

NOTE

Refer to step g. for maintenance on ETC Model S1500.

b. Removal (MET-PRO Model 1500-2600A).

(1) Remove chain guard (para 4-98) and drive chain (para 4-102).

(2) Remove setscrew (4, fig. 4-99) from collar (1) and remove the collar from slurry feeder agitator shaft (2).

(3) Remove disks and hub portion as an assembly (5 through 14, fig. 4-100) of slip clutch assembly (8, fig. 4-99) and key (7, fig. 4-100) from slurry feeder agitator shaft (2, fig. 4-99).

(4) Remove clutch housing (5) with attached sprocket (7) and fiber washer (1, fig. 4-100) from slurry feeder agitator shaft (2).

(5) Remove lubrication fitting (3, fig. 4-99) from slurry feeder agitator shaft (2).

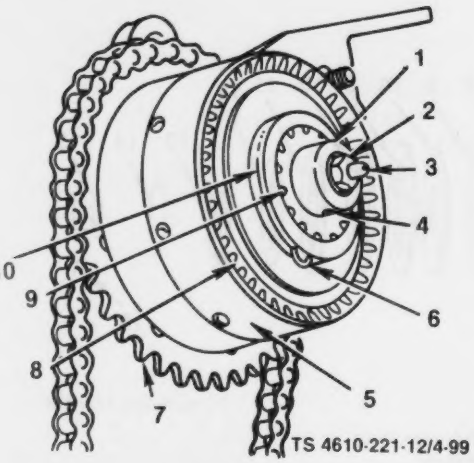
c. Disassembly (MET-PRO Model 1500-2600A).

(1) Remove lockwire (14, fig. 4-100) and adjusting nut (13) from drive hub (6). Turn the adjusting nut counterclockwise to remove it.

(2) In the following order remove spring (12), pressure ring (11), one hub plate (10), a housing plate (9), another hub plate (10), another housing plate (9), and backplate (8) from drive hub (6).

(3) Remove hub lockring (5) from drive hub.

(4) Remove two setscrews (18) and separate clutch housing (4) from the sprocket (2), at the same time removing machine key (17).



NOTE
THIS FIGURE IS NOT
APPLICABLE TO ETC
MODEL S1500

Figure 4-99. Slip Clutch Assembly, Removal

Legend for figure 4-99:

1. Collar
2. Slurry feeder agitator shaft
3. Lubrication fitting
4. Setscrew, 5/16-18 x 1/4 in.
5. Clutch housing
6. Lockwire
7. Sprocket
8. Slip clutch assembly
9. Drive hub
10. Adjusting nut

(5) Remove the two bushings (3) from clutch housing (4) if bushings are determined unserviceable.

d. *Cleaning, Inspection, and Repair.*

WARNING

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(1) Clean all parts of slip clutch assembly with cleaning solvent (item 1, App. E) and dry thoroughly.

CAUTION

Never use fuel, oil, kerosene, or other fluids that will leave an oily film on hub, housing, or backplates.

(2) Inspect adjusting nut for stripped or damaged threads and for distortion. Replace a damaged adjusting nut.

(3) Inspect spring for distortion and lack of spring tension. Replace a defective spring.

(4) Inspect bushings within clutch housing for a loose fit and excessive or uneven wear. Replace defective bushings.

(5) Inspect hub plates, house plates, backplate, drive hub, clutch housing, and sprocket for damaged or distorted teeth. Inspect friction surfaces on hub plates, housing plates, and backplate for scratched, burred, or glazed surfaces. Remove glazing and scratches from the friction surfaces of plates and replace any unserviceable part.

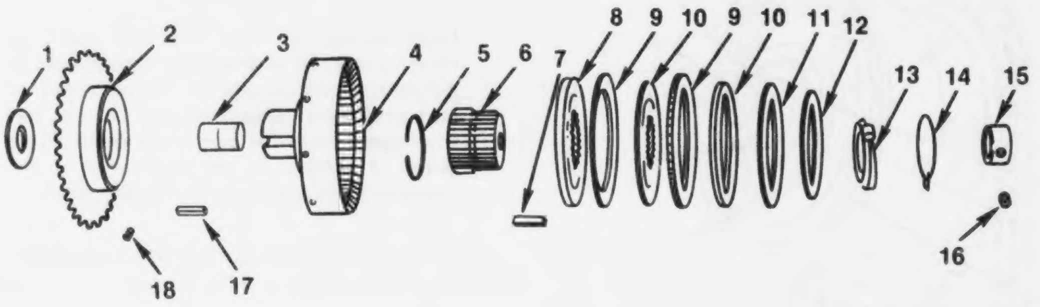
e. ***Reassembly*** (MET PRO Model 1500-2600A).

(1) Press two bushings (3, fig. 4-100) into clutch housing (4).

(2) Install machine key (17) in sprocket (2) and insert clutch housing (4) into sprocket, aligning it on machine key. Secure clutch housing within sprocket with the two setscrews (18).

(3) Install hub lockring (5) on drive hub (6).

(4) In the following order install backplate (8), a housing plate (9), a hub plate (10), another housing plate (9), another hub plate (10), a pressure ring (11), and spring (12) on drive hub.



TS 4610-221-12/4-100

Figure 4-100. Slip Clutch Assembly, Exploded View (MET-PRO Model 1500-2600A)

Legend for figure 4-100:

1. Fiber washer
2. Sprocket
3. Bushing (2)
4. Clutch housing
5. Hub lockring
6. Drive hub
7. Key, machine, 3/16 x 1 1/8 in.
8. Backplate
9. Housing plate (2)
10. Hub plate (2)
11. Pressure ring
12. Spring
13. Adjusting nut
14. Lockwire
15. Collar
16. Setscrew, 5/16-18 x 1/4 in.
17. Key, machine 1/4 x 7/8 in.
18. Setscrew, 5/16-18 x 5/8 in (2)

(5) Secure plates to drive hub with adjusting nut (13) and lockwire (14).

f. Installation (MET-PRO Model 1500-2600A).

(1) Install lubrication fitting (3, fig. 4-99) in slurry feeder agitator shaft (2).

(2) Install fiber washer (1, fig. 4-100) and clutch housing (5, fig. 4-99), with attached sprocket (7), on slurry feeder agitator shaft (2).

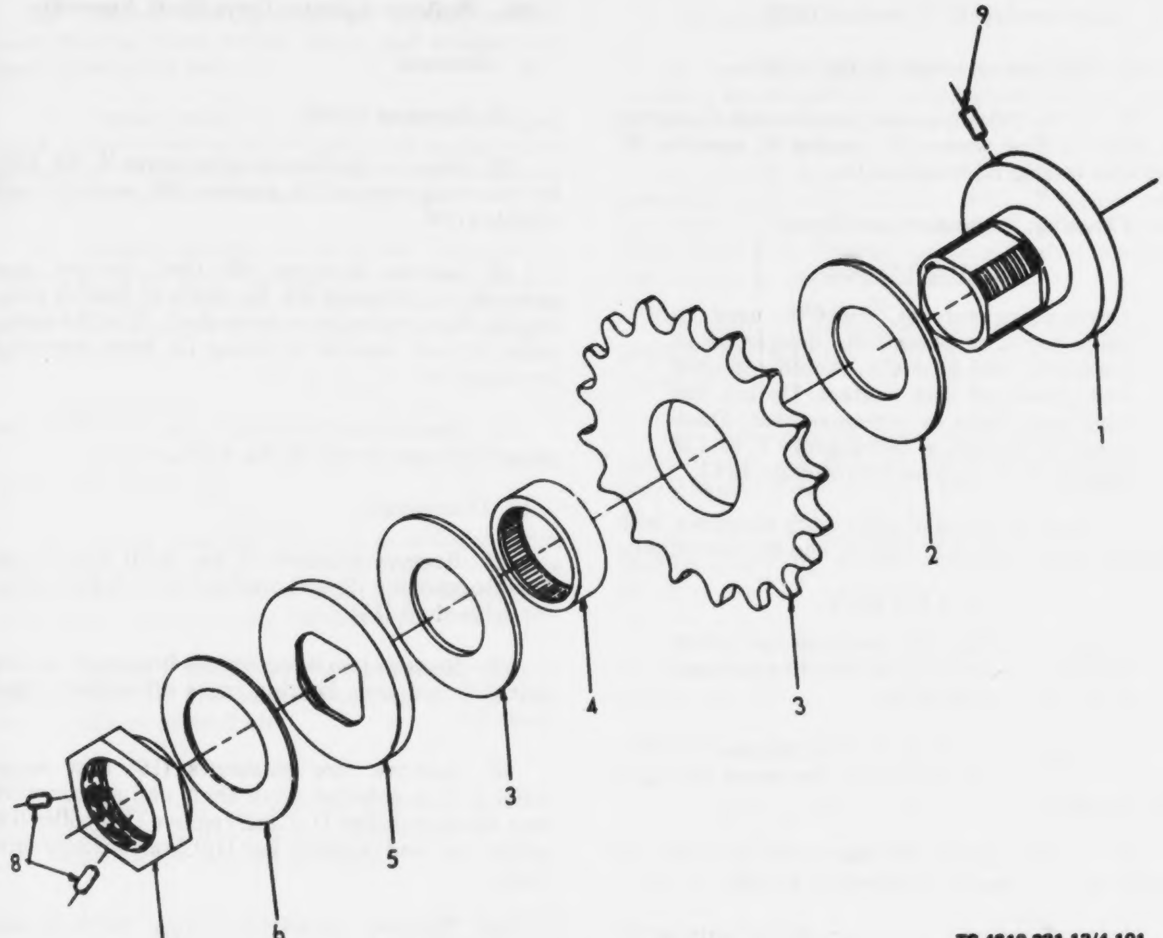
(3) Install machine key (7, fig. 4-100) in slurry feeder agitator shaft (2, fig. 4-99). Install disk and hub portion of slip clutch assembly (8) on slurry feeder agitator shaft, aligning it on machine key.

(4) Install collar (1) on slurry feeder agitator shaft (2) and secure with setscrew (4).

(5) Pull loop end of lockwire (6) out of hole in adjusting nut (10) and place a block under it to keep it out.

(6) Turn adjusting nut clockwise to increase torque and counterclockwise to decrease torque. Gradually turn adjusting nut until a torque of 25 ft-lb (3.5 kg/m) is obtained.

(7) After clutch has been adjusted, make sure adjusting nut (10) is set so loop end of lockwire (6) extends through a hole and into a tooth space in drive hub (9).



TS 4610-221-12/4-101

Figure 4-101. Slip Clutch Assembly, Exploded View (ETC Model S1500)

Legend for figure 4-101:

1. Hub
2. Fiber washer (2)
3. Sprocket
4. Bearing
5. Plate
6. Spring
7. Nut
8. Setscrew (2)
9. Setscrew

(8) Install drive chain (para 4-102) and chain guard (para 4-98).

g. Removal (ETC Model S1500).

(1) Remove chain guard (para 4-98) and drive chain (para 4-102).

(2) Remove setscrew (9, fig. 4-101) from assembly and remove clutch assembly from agitator shaft.

h. Disassembly (ETC Model S1500)

(1) Remove setscrews (8, fig. 4-101).

(2) In the following order remove nut (7), spring (6), plate (5), fiber washer (2), bearing (4), sprocket (3), and fiber washer (2) from hub (1).

i. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of slip clutch assembly with cleaning solvent, (item 1, App. E) and dry thoroughly.

CAUTION

Never use fuel, oil, kerosene, or other fluids that will leave an oily film on hub, housing, or backplates.

(2) Inspect adjusting nut for stripped or damaged threads and for distortion. Replace a damaged adjusting nut.

(3) Inspect spring for distortion and lack of spring tension. Replace a defective spring.

(4) Inspect bushings within clutch housing for a loose fit and excessive or uneven wear. Replace defective bushings.

j. Reassembly (ETC Model S1500).

(1) In the following order, assemble onto hub (1, fig. 4-101), fiber washer (2), sprocket (3), bearings (4), fiber washer (2), plate (5), spring (6) and nut (7).

(2) Install setscrews. (8).

k. Installation (ETC Model S1500)

(1) Install clutch assembly onto agitator shaft and tighten setscrew (9, fig. 4-101).

(2) Turn adjusting nut (7) clockwise to increase torque and counterclockwise to decrease torque. Turn adjusting nut until a torque of 25 ft-lb (3.5 kg/m) is obtained.

(3) Install drive chain (para 4-102) and chain guard (para 4-98).

4-104. Erdlator Agitator Drive Shaft Assembly.

a. Removal.

(1) Remove V-belt.

(2) Remove flexible coupling cover (5, fig. 4-81) by removing screws (19), gaskets (20), seals (17) and washers (18).

(3) Loosen setscrew (3) that secures gear assembly input shaft (16, fig. 4-82) to flexible coupling (2). Remove erdlator drive shaft (5) with bearing units (4) and flexible coupling (2) from mounting brackets (10).

(4) Remove machine key (1, fig. 4-81) from gear assembly input shaft (16, fig. 4-82).

b. Disassembly.

(1) Remove setscrew (3, fig. 4-81) and remove flexible coupling (2) and machine key (4) from erdlator drive shaft (11).

(2) Remove two setscrews (8) from each bearing unit (10) and slide bearing units off erdlator drive shaft (11).

(3) Remove two setscrews (16) that secure collar (12) to erdlator drive shaft and setscrew (15) that secures pulley (14) and remove two collar (12), pulley (14), and machine key (13) from erdlator drive shaft.

(4) Remove lubrication fitting (9) from each bearing unit (10).

c. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean all parts of erdlator drive shaft, pulley, and mounting brackets with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect mounting brackets for cracks, breaks, and distortion. Replace a defective mounting bracket.

(3) Inspect bearing units for cracks, breaks, loose bearing races within block, and evidence of bearing being burned.

(4) Inspect pulley for cracks, breaks, damaged screw threads, and nicks or burrs that would cause premature V-belt wear. Remove all nicks and burrs and replace an otherwise defective pulley.

(5) Inspect flexible coupling for distorted or broken sprocket teeth, damaged screw threads, and for a cracked, broken, or weakened chain. Replace entire flexible coupling if any part of it is damaged or defective.

d. Reassembly.

(1) Install a lubrication fitting, (9, fig. 4-81) in each bearing unit (10).

(2) Install machine key (13) in erdlator drive shaft (11). Slide collar (12) and pulley (14) over machine key in the erdlator drive shaft and loosely secure with two setscrews (16) and setscrew (15).

(3) Loosely install two setscrews (8) in each bearing unit (10) and install a bearing unit on each end of erdlator drive shaft.

NOTE

The inner race of bearing unit will be secured to agitator drive shaft after installation has been accomplished.

(4) Install machine key (4) in erdlator drive shaft. Slide flexible coupling (2) over machine key and secure with setscrew (3).

e. Installation.

(1) Install two mounting brackets (10), fig. 4-82) on motor mount plate (11) and secure with four nuts (8), lockwashers (7) and capscrews (6).

(2) Install machine key (1, fig. 4-81) in rear assembly input shaft (16, fig.. 4-82). Position bearing units (4) to mounting brackets (10) and, at the same time, slide flexible coupling (2) over machine key in gear assembly input shaft (16).

(3) Secure two bearing units (4) to mounting brackets (10) with two nuts (8), lockwashers (7), and capscrews (6).

(4) Pull agitator drive shaft toward erdlator agitator gear assembly (1) and secure flexible couping (2) to gear assembly input shaft (16) with setscrew.

(5) Tighten two setscrews (8, fig. 4-81) in each bearing unit (4, fig. 4-82) to secure bearings to erdlator drive shaft (5).

(6) Install flexible coupling cover (5, fig. 4-81) by installing washers (18), seals (17), gaskets (20) and screws (19).

(7) Install V-belt.

(8) Move pulley to right or left along agitator drive shaft until V-belt is lying vertically in pulley grooves. Tighten two setscrews in collars and setscrew in pulley.

Section XVII. MAINTENANCE OF PUMPS

4-105. Raw Water Pump Assembly.

a. Removal.

(1) Disconnect electrical cable (15, fig. 4-102) from short section of cable attached to electric motor (14).

(2) Remove nuts (12), washers, and screws (11).

(3) Lift electric motor (14) and pump out of frame (1) as an assembly.

b. Clean, Inspect, and Replace.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) *Clean.* Clean pump and motor with cleaning solvent (item 1, App. E).

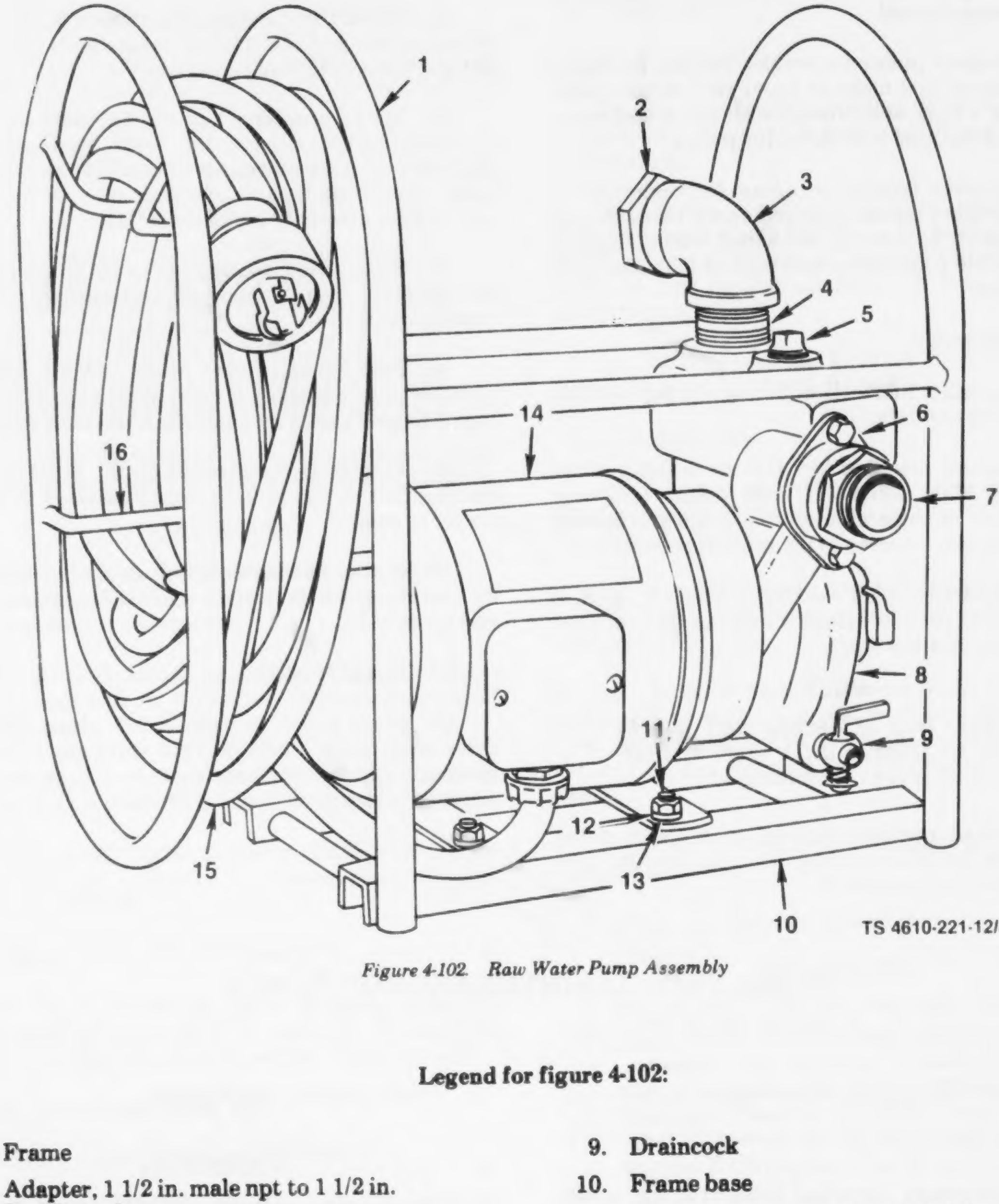


Figure 4-102. Raw Water Pump Assembly

Legend for figure 4-102:

1. Frame
2. Adapter, 1 1/2 in. male npt to 1 1/2 in. female npsh
3. Pipe elbow, 1 1/2 in., 90 degree
4. Pipe nipple, 1 1/2 in. x 1 3/4 in.
5. Pump priming plug
6. Water intake flange
7. Adapter, 1 1/2 in. male npt to 1 1/2 in. male npsh
8. Pump impeller housing
9. Draincock
10. Frame base
11. Screw, cap hex, 3/8-16 1 1/2 in (4)
12. Nut, hex, 3/8-16 (4)
13. Washer, lock, 3/8 in. (4)
14. Electric motor
15. Electrical cable
16. Hose and cable bracket

(2) Inspect.

(a) Inspect motor for signs of overheating and a damaged electrical cable.

(b) Inspect pump for binding and a damaged or cracked housing.

(3) Replace. Replace assembly if either motor or pump is damaged.

c. *Installation.*

(1) Position pump in frame (1, fig. 4-102) and install screws (11), washers (13), and nuts (12).

(2) Attach electric cable (15) to short section of cable attached to electric motor.

(3) Wrap cable around hose and cable bracket (16).

4-106. Raw Water Pump Peeler.

a. *Location and Purpose.* The peeler is located inside pump in discharge opening of pump case. The peeler is adjustable to control output of pump.

b. *Adjustment.*

(1) Drain pump case and remove cover plate

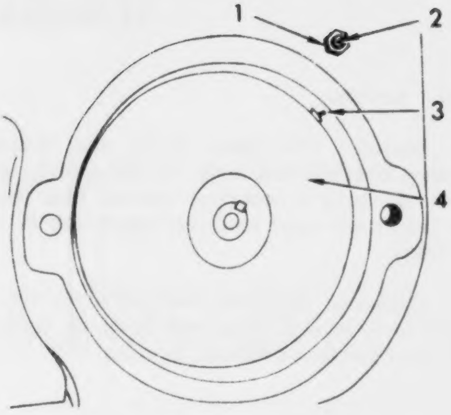
(2) Loosen jamnut (1, fig. 4-103) and setscrew (2) to loosen peeler (3).

(3) Set peeler so there is 1/64 in. clearance between edge of peeler and impeller (4).

(4) Rotate impeller by hand to be sure it does not touch peeler.

(5) Secure peeler (3) with setscrew (2) and lock setscrew with nut (1).

(6) Install pump cover plate.



TS 4610-221-12/4-103

Figure 4-103. Raw Water Pump Peeler

Legend for figure 4-103:

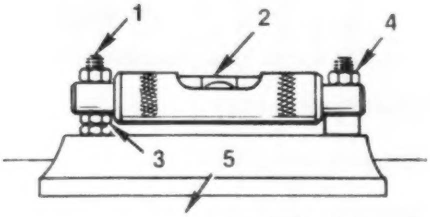
1. Nut, jam, hex, 1/4-20
2. Setscrew, sq-hd, cup joint, 1/4-20 x 1 in.
3. Peeler
4. Impeller

Section XVIII. MAINTENANCE OF PRECISION AND TOPOGRAPHICAL INSTRUMENTS

4-107. Levels.

a. General. The three levels are mounted in recesses outside van body on right, left, and rear sides and have a neoprene curtain over each one. The levels are used to direct operation of leveling van body.

b. Removal. Remove two nuts (4, fig. 4-104) and remove level (2) from van body (5). Remove the two other levels in a similar manner.



TS 4610-221-12/4-104

Figure 4-104. Level, Removal

Legend for figure 4-104:

1. Screw, machine, No. 10-32 x 5/8 in. (6)
2. Machinists level, single face, 4 in. (3)
3. Adjusting nut, No. 10-32 (6)
4. Nut
5. Van body

c. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F to 138 degrees F (38 degrees C to 59 degrees C).

(1) Clean level with cleaning solvent (item 1, App. E) and dry thoroughly.

(2) Inspect level for cracks, breaks, stripped threads, or broken bubble glass. Replace a damaged or defective level.

d. Installation. Position level (2, fig. 4-104) on van body (5) and secure with two nuts (4). Install the other levels in similar manner.

APPENDIX A

REFERENCES

A-1. Fire Protection.

TM 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users

A-2. Lubrication.

LO 5-4610-221-12	Lubrication Order, Water Purification Unit: Van Type Body Mounted, Electric Driven, AC, 115/208V, Single and 3 Phase, 60 Cycle, 1/20 to 2 HP; 1500 GPH (MET-PRO MODEL 1500-2600A)
C91001L	Fuels, Lubricants, Oils, and Waxes. Water Purification Unit: Van-Type, Body Mounted, Electric Drive, AC, 115/208V, Single and 3 Phase, 60 Hertz, 1/20 to 2 HP, 1500 GHP (Met Pro Model 1500-2600A)
LO 9-2320-209-12	Lubrication Order: Truck, 2½ Ton, 6x6 Cargo M34, M35, M36, Chassis M44, M45, M46, M57, M58 Dump M47, M59 Wrecker M60, M108 Series, Van M109
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by U.S. Army

A-3. Painting.

AR 746-1	Color, Marking, and Preparation of Equipment for Shipment

A-4. Maintenance.

FM 29-2	Organizational Maintenance Management
TM 9-207	Operation and Maintenance of Ordnance Material in Cold Weather (0 to -65 degrees F)
TB 750-651	Use of Antifreeze Solutions for Cleaning Compounds in Engine Cooling Systems
TM 5-764	Electric Motor and Generator Repair
TM 9-2610-200-20	Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes
TM 9-6140-200-14	Operator, Organizational, Direct Support and General Support Maintenance Manual: Storage Batteries, Lead-Acid Type
TM 11-483	Radio Interference Suppression
TM 750-254	Cooling System, Tactical Vehicles
TM 5-4610-221-20P	Organizational Maintenance Repair Parts and Special Tools List: Water Purification Unit, MET-PRO Model 1500-2600A
TM 5-4610-221-34P	Direct and General Support and Depot Maintenance Repair Parts and Special Tools List: Water Purification Unit, MET-PRO Model 1500-2600A
TM 5-4520-233-14	Operator, Organizational, Direct Support and General Support Maintenance Manual, Heater, Space Multifuel

TM 5-4520-233-24P	Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List, Heater, Space, Multifuel
TM 902320-209-10	Operator's Manual for 2½ Ton, 6x6, Chassis, Truck M44, M45, M46, M47, M58 Dump M47, M59, M567, M60, M108 and M109 Series
TM 5-660	Operation of Water Supply and Treatment Facilities at Fixed Army Installation
TM 5-700	Field Water Supply
TM 5-6630-215-12	Water Quality Analysis Set, Preventive Medicine (NSN 6630-00-140-7826), Engineer (NSN 6630-00-140-7820)
TM 5-4320-200-15	Operator, Organizational, Direct Support, General Support and Depot Maintenance Manual, Including Repair Parts List: Pump, Centrifugal, Electric Motor Driven, 65GPM.
TM 5-4320-208-12	Operator and Organizational Maintenance Manual: Pump, Centrifugal, Gasoline Engine Driven, 125 GPM
TM 5-4320-208-20P	Operator and Organizational Maintenance Repair Parts List: Pump, Centrifugal, Gasoline Engine Driven, 125 GPM

A-5. Shipment and Storage.

TB 740-97-2	Preservation of USAMECOM Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

A-6. Demolition.

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope.

This appendix lists integral components of and basic issue items for the water purification unit to help you inventory items required for safe and efficient operation.

B-2. General.

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the water purification unit and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the water purification unit in operation, to operate it, and to perform emergency repairs. Although shipped separately packed, they must accompany the water purification unit during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE-MTOE authorization of the end item.

B-3. Explanation of Columns.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates figure number of illustration on which item is shown.

(2) Item Number. The number used to identify item called out in illustration.

b. National Stock Number. Indicates the National stock number assigned to item and which will be used for requisitioning.

c. Part Number. Indicates primary number used by manufacturer, which controls design and characteristics of item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

d. Description. Indicates Federal item name and, if required, a minimum description to identify item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. "USABLE ON" codes are included to help you identify which component items are used on the different models.

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the RCV'D column, list the quantity you actually receive on your major item. the DATE columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

Section II. COMPONENTS OF END ITEM LIST

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		4390-00-288-1511	MIL-L-4387, type IV, class 1, style B	ADAPTER, GREASE GUN COUPLING: hydraulic; flexible; 12 in. lg; 1/8 in. - 27 internal thd coupling; u/w; LUBRICATION GUN, HAND: NSN 4930-00-253-2478.			1				
		4730-00-277-6844	MIL-C-52404, type XVI, class C	ADAPTER, STRAIGHT, PIPE TO HOSE: Copper alloy; pipe end 1-1/2 in. - 11-1/2 NPT, external; Hose end, 1-1/2 in. -11-1/2 NPSH, external.			3				
		4730-00-278-8271	MIL-C-52404, type XVI, class B	ADAPTER, STRAIGHT, PIPE TO HOSE: Copper alloy; pipe end 1-1/2 in. - 11-1/2 NPT, external; Hose end, 1-1/2 in. - 11-1/2 NPSH, internal.			2				
		4730-00-298-8141	MIL-C-52404, type XVI, class B	ADAPTER, STRAIGHT, PIPE TO HOSE: Copper alloy; pipe end 1-1/2 in. - 11-1/2 NPT, external; Hose end, 2 in. - 11-1/2 NPSH, internal.			1				
		4730-00-277-6845	MIL-C-52404, type XVI, class C	ADAPTER, STRAIGHT, PIPE TO HOSE: Copper alloy; pipe end 1-1/2 in. - 11-1/2 NPT, external; Hose end, 2 in. 11-1/2 NPSH, external.			2				
		4730-00-193-0897	WW-P-471, type II, style A	BUSHING, PIPE: malleable iron; black; outside hex; 2 in. -11-1/2 NPT, external 1-1/2 in. - 11-1/2 NPT, internal.			2				
		6145-00-553-6174	MIL-C-3432, type CO-03H LF (3/4-3/10 R) 1170-0030	CABLE, POWER, ELECTRICAL: ptbl cord; 600 v; 3 copper conductors; no. 4 AWG; stranded; 133 strands, no. 25 AWG; w/gnd wires; synthetic rubber insulated; covering in sequence from conductors is synthetic rubber.			50ft				

Section III. BASIC ISSUE ITEMS

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		4610-00-887-1235		Cable assembly.			2				
		4610-00-887-1236	MIL-C-52286/27.	Cable assembly.			3				
		7330-00-972-5211		Paddle.			1				
		4730-00-104-6209		Blind flange.			6				
		4730-00-231-2411		Pipe cap conforming to ANS B16.3, 1/2-inch nominal pipe size.			6				
		5305-00-717-5467	MS35307-362.	Hexagon head capscrew			12				
		4730-00-277-6191	MS35842-15.	Hose clamp			12				
		4610-00-066-2478		Float.			1				
		5975-00-972-8028		Ground rod.			1				

Section II. COMPONENTS OF END ITEM LIST - Cont

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		6810-00-242-4770	O-C-114, type I	CALCIUM HYPOCHLORITE, TECHNICAL: 3-3/4 lb plastic bottle.			24				
		6810-00-264-6575	MIL-C-506	CHARCOAL, ACTIVATED, POWERED: 50 lb drum.			1				
		2320-00-835-8196	MIL-T-46780	CHASSIS, TRUCK: 2-1/2 ton; 6 X 6, w/winch; TACOM Model M45 A2, No. 87365705.			1				
		6630-01-044-0334	MIL-C-538	COMPARATOR, COLOR: c/o: 1 ea Color comparator with prismatic eyepiece assembly. 4 ea Rectangular sample cells. 1 ea pH reagent bottle, with eye dropper. 1 ea DPD chlorine color, disk. 1 ea pH color disk. Operating instructions. Service data. Carrying case. Reagent: Tablet, reagent DPD (6810-01-044-0315)			1				
		4320-00-344-4602	MERADCOM 13217E9357	COVER, PUMP: cotton; olive drab; insulated; 21-3/4 in. lg, 13-1/2 in. w, 22 in. h.			2				
		6810-00-664-0283	MIL-F-14580	FERRIC CHLORIDE, ANHYDROUS, CRYSTALLINE TECHNICAL: 100 one lb bags per drum.			3				
		9390-00-443-4703	MIL-F-52637	DIATOMACEOUS EARTH: calcined; powder; 3 cu ft sack.			9				
		6640-00-431-4520	MIL-G-36614, type II, size 2	GRADUATE, LIQUID, LABORATORY: cres; graduated in metric and apothecary scales; 1,000 ml; w/handle.			1				
		5120-00-242-3917	GGG-H-86, type II, class 1, style A	HAMMER, HAND: machinist's; ball peen; 1 lb head; w/fiberglass handle.			1				

Section II. COMPONENTS OF END ITEM LIST - Cont

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		4720-00-202-6731	ZZ-H-561, type I, grade B	HOSE ASSEMBLY, NONMETALLIC: Brass fittings; smooth bore inner surface; thd end connection; Composition, natural or synethic molded outer covering, wrapped; wire reinforced; 100 psi test pressure; WW-C-624, type B1, expansion ring, rocker lug, rigid external thd one end and swivel internal thd other end; 1-1/2 in id; 10 ft. lg, excl couplings.			8				
		4720-00-202-7220	ZZ-H-561, type I, grade B	HOSE ASSEMBLY, NONMETALLIC: Brass fittings; smooth inner surface; thd end connection; Synthetic; synthetic molded outer covering; 20 in. mercury wp; fittings attached w/expansion rings; swivel internal fitting has guard, pin or rocker lug wrenching feature; ends are capped; hose branded "WATER SUCTION" and "S" for synthetic; 2 in. id, 2 in. -NPSH, internal.							
		4720-00-289-6123	ZZ-H-45	HOSE, TEXTILE FIBER, RUBBER LINED: single jacket; synthetic; 300 psi test pressure; rocker lug, rigid external thd and swivel internal thd other end; copper alloy; 1-1/2 in. -11-1/2 NPSH, WW-C-621, type B1, 1-1/2 in. id; 25 ft lg, excl couplings.			6				
		6810-00-087-2340	MIL-I-52701	INDICATOR SOLUTION, pH WIDE RANGE: 16 oz plastic bottle.			1				
		5120-00-595-9245	GG-K-275, type I, class 1 and 2	KEY SET, SOCKET HEAD SCREW: hex drive; L-type handle; w/case; c/o:			7				
		5120-00-198-5400		1 ea KEY, SOCKET HEAD SCREW: 0.035 in. w across flats, 1-3/8 in. lg.							

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		5120-00-198-5401		1 ea KEY, SOCKET HEAD SCREW: 0.050 in. w across flats, 1-21/32 in. lg.							
		5120-00-198-5398		1 ea KEY, SOCKET HEAD SCREW: 1/16 in. w across flats, 1-3/4 in. lg.							
		5120-00-224-2504		1 ea KEY, SOCKET HEAD SCREW: 5/64 in. w across flats, 1-7/8 in. lg.							
		5120-00-242-7410		1 ea KEY, SOCKET HEAD SCREW: 3/32 in. w across flats, 2 in. lg.							
		5120-00-240-5292		1 ea KEY, SOCKET HEAD SCREW: 1/8 in. w across flats, 2-1/4 in. lg.							
		5120-00-198-5392		1 ea KEY, SOCKET HEAD SCREW: 5/32 in. w across flats, 2-1/2 in. lg.							
		5120-00-240-5300		1 ea KEY, SOCKET HEAD SCREW: 3/16 in. w across flats, 2-3/4 in. lg.							
		5120-00-242-7411		1 ea KEY, SOCKET HEAD SCREW: 7/32 in. w across flats, 3 in. lg.							
		5120-00-224-4659		1 ea KEY, SOCKET HEAD SCREW: 1/4 in. w across flats, 3-1/4 in. lg.							
		5120-00-240-5274		1 ea KEY, SOCKET HEAD SCREW: 5/16 in. w across flats, 3-3/4 in. lg.							
		5120-00-198-5390		1 ea KEY, SOCKET HEAD SCREW: 3/8 in. w across flats, 4-1/4 in. lg.							
		5120-00-198-5391		1 ea KEY, SOCKET HEAD SCREW: 1/2 in. w across flats, 5-1/4 in. lg.							

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		5120-00-240-5268		1 ea KEY, SOCKET HEAD SCREW: 9/16 in. wide across flats, 5-3/4 in. lg.							
		5120-00-224-2510		1 ea KEY, SOCKET HEAD SCREW: 5/8 in. w across flats, 6-1/4 in. lg.							
		5110-00-240-5943	GG-K-484, type II, class 1, style A	KNIFE, POCKET: general purpose.			1				
		6230-00-164-7061	W-L-661, type III, class 1	LIGHT, EXTENSION: 2 conductors, type SJ cable, 25 ft lg; 2 parallel blade plug connector one end; wire guard, integral, reflector and hook; rubber or molded plastic handle w/switch; 100 w medium screw base lamp accomodated.			1				
		6230-00-239-3523	ARMCOM No. 6209297	LIGHT, EXTENSION: 2 conductors; ac bayonet plug connector; 25 ft lg water resistant cable, MIL-C-13486/5-1; cast metal guard open end; integral reflector and 2 hooks, rubber handle adjustable blackout shield and fusible plug; accom 1 dc bayonet candelabra base lamp.			1				
		6810-00-585-2017	MIL-L-14519	LIMESTONE, PULVERISED: calcium carbonate, 93 pct min; powder; USS sieve no. 100, pct max retained, no. 325, 35 pct max passing; 100 lb paper bag.			6				
		4930-00-253-2478	MIL-G-3859, type I	LUBRICATING GUN, HAND: lever operated; spring primed; 14 oz; 6000 psi, 6-1/2 in. lg rigid bent tube extension; hydraulic coupler; w/loader fitting.			1				

Section II. COMPONENTS OF END ITEM LIST - Cont

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		4610-00-914-5688	MIL-M-52372,	MEASURE, DRY CHEMICAL, WATER PURIFICATION: Aluminum; limestone; 1/2 lb graduations; filter aid, 58 and 115 cu in. graduations; 5-1/2 lb.			1				
		7420-00-205-0810	MIL-M-52372,	MEASURE, DRY CHEMICAL, WATER PURIFICATION: Plastic; calcium hypochlorite; 1/4 lb graduations; 1-1/4 lb.			1				
		4930-00-902-4642	MIL-N-52110, type I, size 2	NOZZLE, FUEL AND OIL SERVICING: pistol grip, self-closing; w/integral strainer; 1-1/2 in. NPT internal inlet; rigid spout; w/reducing bushing, dust cap, strainer and nozzle.			2				
		6810-00-270-8289	UXA7787 (79172)	O-TOLIDINE DIHYDROCHLORIDE SOLUTION: 16 oz plastic bottle.			1				
		7420-00-246-1097	MIL-P-52415, size 2	PAIL, UTILITY: plastic or rubber; 3 gal; pouring lip; w/bail.			3				
		5120-00-223-7397	GGG-P-471, type II, class 2, style A	PLIERS, SLIP JOINT: straight nose; 8 in. lg; w/cutter.			1				
		4320-00-289-7977	MIL-P-14514, type I	PUMP, CENTRIFUGAL: Fresh water; Elec mtr driven, ac, 208 v, 3 phase, 60 Hz, 2 hp; frame mtd; 1-1/2 in. inlet, 1-1/2 in. outlet, thd; 65 gpm at 50 ft head; make and model unspecified.			2				
		5120-00-234-8913	GGG-S-121, type VI, class 1, style 1	SCREWDRIVER, CROSS TIP: no. 2 tip; 4 in. lg blade; plastic handle.			1				
		5120-00-234-8910	GGG-S-121, type 1, design A, shape a	SCREWDRIVER, FLAT TIP: flared; 5/16 in. w tip; 6 in. lg blade; plastic handle.			1				

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		7330-00-153-9760	RR-S-131	SCOOP, KITCHEN: cres; 7-7/8 in. lg, 5-1/4 in. w; 4 in. lg handle.			1				
		4730-00-202-8409	MIL-C-52404, type XIII	SIAMESE CONNECTION, PIPE TO HOSE: brass; plain; 1-1/2 in. -11-1/2 NPT, external; Siamese end, 1-1/2 in. - 11-1/2 NPSH, swivel internal; rocker lug.			1				
		6810-00-986-3471	UXA9931 (79172)	SODIUM ARSENITE SOLUTION: 16 oz plastic bottle.			1				
		4730-00-684-4296	MIL-S-12165, type II	STRAINER, SUCTION HOSE: brass; cylindrical 1-1/2 in. - 11-1/2 NPSH, interna internal; 4-1/2 in. lg; hex or octagon wrenching feature; no. 35 inside cut V-slots.			1				
		2330-00-141-8050	MIL-T-10579	TRAILER, CARGO: 1-1/2 ton; 2 wheels; MIL Design M105A2; TACOM no. 8358993.			1				
		4820-00-288-7568	WW-V-54, type II, class A, style 1	VALVE, GATE: Bronze; wedge disc, rising stem, inside screw, 125 psi wp; 1-1/2 in. -11-1/2 NPT.			1				
		4820-00-595-1847	WW-V-54, type II, class A, style 1	VALVE, GATE: Bronze; wedge disc, rising stem, inside screw, 125 psi wp; 2 in. - 11-1/2 NPT.			1				
		4610-00-202-8348	MIL-W-52482	WATER PURIFICATION UNIT, VAN TYPE BODY MOUNTED: elec mtr driven, ac/dc, 115/208 v, single and 3 phase, 60 Hz, 1/20 to 2 hp; manual control hypochlorinator, 2-1/2 gph; 1 slurry and 1 solution feeder; slurry blanket solids contact clarifier; 27.5 sq ft separation area, 646 gal. vol; 1 pressure filter unit, diatomaceous earth, 10 sq ft area; 1,500 gph, incl Lifting Kit NSN 4910-00-168-2600; make and model unspecified.			1				

Section II. COMPONENTS OF END ITEM LIST - Cont

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		5120-00-240-5328	GGG-W-631, type I, class 1	**WRENCH, ADJUSTABLE: Steel, chromium plated; open end; single head; 0 to 15/16 in. jaw opening; 8 in. lg.**			1				
		5120-00-264-3796	GGG-W-631, type I, class 1	**WRENCH, ADJUSTABLE: Steel, chromium plated; open end; single head; 0 to 1-24/64 in. jaw opening; 12 in. lg.**			1				
		5120-00-187-7123	GGG-W-636, type IV	**WRENCH, OPEN END: Fixed; double head, 15 deg angle; 7/16 and 1/2 in. openings; 1/4 in. thk head; 5 in. lg.**			1				
		5120-00-187-7126	GGG-W-636, type IV	**WRENCH, OPEN END: Fixed; double head, 15 deg angle; 9/16 and 5/8 in. openings; 19/64 in. thk head; 6 in. lg.**			1				
		5120-00-277-8300	GGG-W-636, type IV	**WRENCH, OPEN END: Fixed; double head, 15 deg angle; 11/16 and 13/16 in. openings; 3/8 in. thk head; 7-1/2 in. lg.**			1				
		5120-00-187-7131	GGG-W-636, type IV	**WRENCH, OPEN END: Fixed; double head, 15 deg angle; 7/8 and 15/16 in. opening 13/32 in. thk head; 9 in. lg.**			1				
		5120-00-277-1479	GGG-W-651, type II, class C	**WRENCH, PIPE: adjustable jaw, Stillson pattern; aluminum alloy; 1 to 2 in. ips, 18 in. lg; 3 lb 3 oz.**			2				
		5120-00-293-1602	GGG-W-665, type V	**WRENCH, SPANNER: universal hose coupling; u/o pin-lug, and rocker-lug; 1 to 3 in. hose coupling; forcible-entry tool and cored to fit gas cock shut off; 11 in. lg; 1 lb.**			2				

APPENDIX C

Additional authorization list

Section I. INTRODUCTION

C-1. Scope.

This appendix lists additional items you are authorized for support of the water purification unit.

C-2. General.

This list identifies items that do not have to accompany the water purification unit and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C-3. Explanation of Listing.

National stock numbers, descriptions, and quantities are provided to help you identify and request additional items you require to support this equipment.

(1) Illustration (a) Figure No.	(1) Illustration (b) Item No.	(2) National Stock Number	(3) Part No. & FSCM	(4) Description	(5) Location	(6) Usable on Code	(7) Qty Reqd	(8) Quantity Rcv'd	(8) Quantity Date	(8) Quantity Date	(8) Quantity Date
		5120-00-187-7123	GGG-W-636, type IV	WRENCH, OPEN END: Fixed; double head, 15 deg angle; 7/16 and 1/2 in. openings, 1/4 in. thk head; 5 in. lg.			1				
		5120-00-187-7126	GGG-W-636, type IV	WRENCH, OPEN END: Fixed; double head, 15 deg angle; 9/16 and 5/8 in. openings; 19/64 in. thk head; 6 in. lg.			1				
		5120-00-277-8300	GGG-W-636, type IV	WRENCH, OPEN END: Fixed, double head, 15 deg angle; 11/16 and 13/16 in. openings; 3/8 in. thk head; 7-1/2 in. lg.			1				
		5120-00-187-7131	GGG-W-636, type IV	WRENCH, OPEN END: Fixed, double head, 15 deg angle; 7/8 and 15/16 in. openings; 13/32 in. thk head; 9 in. lg.			1				
		5120-00-277-1479	GGG-W-651, type II, class C	WRENCH, PIPE: adjustable jaw, Stillson pattern; aluminum alloy; 1 to 2 in. ips; 18 in. lg; 3 lb 3 oz.			2				
		5120-00-293-1602	GGG-W-665, type W	WRENCH, SPANNER: universal hose coupling; u/o pin-lug; 1 to 3 in. hose coupling; forcible-entry tool and cored to fit gas cock shut off; 11 in. lg; 1 lb.			2				

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		5120-00-198-5390		1 ea KEY, SOCKET HEAD SCREW: 3/8 in. w across flats, 4-1/4 in. lg.							
		5120-00-198-5391		1 ea KEY, SOCKET HEAD SCREW: 1/2 in. w across flats, 5-1/4 in. lg.							
		5120-00-240-5268		1 ea KEY, SOCKET HEAD SCREW: 5/8 in. w across flats, 5-3/4 in. lg							
		5120-00-224-2510		1 ea KEY, SOCKET HEAD SCREW: 5/8 in. w across flats, 6-1/4 in. lg.							
		5110-00-240-5943	GG-K-484, type II, class 1, style A	KNIFE, POCKET: general purpose.			1				
		4930-00-253-2478	MIL-G-3859, type I	LUBRICATING GUN, HAND: lever operated; spring primed; 14 oz; 6000 psi, 6-1/2 in. lg rigid bent tube extension; hydraulic coupler; w/loader fitting.			1				
		5120-00-223-7397	GGG-P-471, type II, class 2, style A	PLIERS, SLIP JOINT: straight nose; 8 in. lg; w/cutter.			1				
		5120-00-234-8910	GGG-S-121, type I, design A, shape a	SCREWDRIVER, FLAT TIP: flared, 5/16 in. w tip; 6 in. lg blade; plastic handle.			1				
		5120-00-234-8913	GGG-S-121, type VI, clas class 1, style 1	SCREWDRIVER, CROSS TIP: no. 2 tip; 4 in. lg. blade; plastic handle.			1				
		5120-00-240-5328	GGG-W-631, type I, class 1	WRENCH, ADJUSTABLE: Steel, chromium plated; open end; single head; 0 to 15/16 in. jaw opening; 8 in. lg.			1				
		5120-00-264-3796	GGG-W-631, type I, class 1	WRENCH, ADJUSTABLE: Steel, chromium plated; open end; single head; 0 to 1-24/64 in. jaw opening; 12 in. lg.			1				

Section II. ADDITIONAL AUTHORIZATION LIST

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable on Code	Qty Reqd	Rcv'd	Date	Date	Date
		5120-00-242-3917	GGG-H-86 type II, class 1, style A	HAMMER, HAND: machinist's; ball peen; 1 lb. head; w/fiber-glass handle.			1				
		5120-00-595-9245	GGG-K-275, type I, class 1 and 2	KEY SET, SOCKET HEAD SCREW: hex drive; L-type handle; w/case; c/o:			1				
		5120-00-198-5400		1 ea KEY, SOCKET HEAD SCREW: 0.035 in. w across flats, 1-3/8 in. lg.							
		5120-00-198-5401		1 ea KEY, SOCKET HEAD SCREW: 0.050 in. w across flats, 1-21/32 in. lg.							
		5120-00-198-5398		1 ea KEY, SOCKET HEAD SCREW: 1/16 in. w across flats, 1-3/4 in. lg.							
		5120-00-224-2504		1 ea KEY, SOCKET HEAD SCREW: 5/64 in. w across flats, 1-7/8 in. lg.							
		5120-00-242-7410		1 ea KEY, SOCKET HEAD SCREW: 3/32 in. w across flats, 2 in. lg							
		5120-00-240-5292		1 ea KEY, SOCKET HEAD SCREW: 1/8 in. w across flats, 2-1/4 in. lg.							
		5120-00-198-5392		1 ea KEY, SOCKET HEAD SCREW: 5/32 in. w across flats, 2-1/2 in. lg.							
		5120-00-240-5300		1 ea KEY, SOCKET HEAD SCREW: 3/16 in. w across flats, 2-3/4 in. lg.							
		5120-00-242-7411		1 ea KEY, SOCKET HEAD SCREW: 7/32 in. w across flats, 3 in. lg.							
		5120-00-224-4659		1 ea KEY, SOCKET HEAD SCREW: 1/4 in. w across flats, 3-1/4 in. lg.							
		5120-00-240-5274		1 ea KEY, SOCKET HEAD SCREW: 5/16 in. w across flats, 3-3/4 in. lg.							

APPENDIX D

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

D-1. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on identified end item or component. The implementation of maintenance functions upon end item or component will be consistent with assigned maintenance functions.

c. Section III lists special tools and test equipment required for each maintenance function as referenced from Section II. (Not applicable).

d. Section IV contains supplemental instructions or explanatory notes for a particular maintenance function.

D-2. Maintenance Functions.

a. Inspect. To determine serviceability of an item by comparing its'physical, mechanical and/or electrical characteristics with established thorough examination.

b. Test. To verify serviceability and detect incipient failure by measuring mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like-new condition.

k. Rebuild. Consists of those services/actions necessary for restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuilding is the highest degrees of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

D-3. Column Entries Used in the MAC.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph D-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by listing of a "work time" figure in appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents active time required to perform the maintenance function at indicated level of maintenance. If the number or complexity of tasks within listed maintenance function vary at different maintenance levels, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time, in addition to time required to perform specific tasks identified for maintenance functions, authorized in the maintenance allocation chart. The symbol designations for various maintenance levels are as follows:

C	Operator or Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, test and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall contain a letter code in alphabetic order which shall be keyed to remarks contained in Section IV.

D-4. Column Entries Used in Tool and Test Equipment Requirements.

a. Column 1, Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a maintenance function on identified end item or component.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use tool or test equipment.

c. Column 3, Nomenclature. Name or identification of tool or test equipment.

d. Column 4, National/NATO Stock Number. The National or NATO stock number of tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

D-5. Explanation of Columns in Section IV.

a. Reference Code. The code scheme recorded in Column 6, Section II.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated on the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
01	FUEL SYSTEM								
	Tank Lines and Fittings								
	Lines and fitting from tank to heater	Replace		1.5					A
02	ELECTRICAL SYSTEM (ENGINE & VEHICULAR)								
	Head, tail and marker lights								
	Clearance lights: (Lamp Assy) Incandescent lamp, lens and door:	Service	0.2						
		Inspect	0.2						
		Repair		0.3					
		Replace		0.3					
	Additional Lights								
	Light dome, flush mounted with hinged cover: (Lamp Assy)	Inspect	0.2						
		Repair		0.2					
		Replace		0.2					
03	FRAME								
	Frame Assembly								
	Toolbox and pump frame:	Inspect	0.3						
		Repair		0.3					
		Replace		0.2					
	Landing Gears								
	Leveling jacks (mechanical or hydraulic)	Service	0.3						
		Inspect	0.2						
		Repair			1.0				
		Replace		1.0					
	Ladder Assy	Replace		0.2					
	Chain pin assembly:	Repair		0.2					
		Replace		0.2					
04	BODY, CAB, HOOD, HULL								
	Stowage racks, boxes, scraps:								
	Accessory stowage box:	Replace		0.3					
	Jack stowage box	Replace		0.3					
	Special Purpose Bodies:								
	Van body assy	Service	0.5						
		Inspect	0.2						
		Repair		8.0					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
04	BODY, CAB, HOOD, HULL (Cont)								
	Door latches and handles:	Replace		3.0					
	Windows	Repair		4.0					
		Replace		4.0					
	Doors and ramps:	Repair		8.0					
		Replace		8.0					
05	MISCELLANEOUS BODY CHASSIS OR HULL, AND ACCESSORY ITEMS.								
	Mirrors, Reflectors, Personnel Heaters, Defrosters, Wipers, Air Horns	Replace		0.1					
	Personnel heater assembly:	Inspect	0.2						
		Service	0.2						
		Repair			1.0				
		Replace		0.8					
	Electric fuel pump heater:	Service	0.2						
		Replace		0.5					
	Screen	Service	0.2						
	Gasket	Replace		0.3					
	Fuel filter	Service	0.2						
		Replace	0.3						
	Packing, seal and element assembly	Replace		0.3					B
	Gasket, bowl and element	Replace		0.2					C
	Solenoid valve	Service	0.2						
		Replace		0.2					C
	Fuel valve	Service	0.2						
		Replace		0.2					B
	Sight glass	Service	0.2						
		Replace		0.2					C
	Heater, combustion chamber	Service	0.5						
		Replace		1.0					
	Glow plug	Service	0.4						C
		Replace	0.3						
	Float bowl assembly	Repair			0.5				C
		Replace		0.5					
	Needle valve	Service	0.3						C
		Replace		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
05	MISCELLANEOUS BODY CHASSIS OR HULL, AND ACCESSORY ITEMS. (Cont)								
	Spark plug	Service	0.2						
		Replace		0.3					
	Indicator light, lens and lamp:	Replace		0.3					
	Heater exhaust stack	Inspect	0.2						
		Replace			0.6				
	Fuel lines, heaters:	Service			0.3				
		Inspect			0.3				
		Replace			0.5				A
	Thermostat, heater:	Replace		0.5					C
	Burner head assembly	Service			0.2				C
		Replace			0.5				
	Burner head assembly	Service			0.2				
		Replace			0.5				B
	Selenium rectifier	Inspect			0.2				
		Replace			0.5				B
	Transformer	Inspect			0.5				
		Replace			1.0				B
	Base assembly, relay mounting	Inspect			0.3				
		Repair			0.5				B
		Replace			0.5				
	Fuse:	Replace		0.2					
	Box assembly, ignition coil	Inspect			0.2				
		Repair			0.5				B
		Replace			1.0				
	Control box assy	Inspect			0.3				
		Repair			0.5				
		Replace			0.5				
	Reflectors, red and amber:	Service	0.2						
		Inspect	0.2						
		Replace	0.2						
	Data plates and Instruction holders:	Inspect	0.2						
		Replace	0.3						

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
06	ACCESSORIES, PUBLICATION, TEST EQUIPMENT AND TOOLS.								
	Accessories:								
	Adapter hose:	Replace	0.2						
	Cap, pipe:	Replace	0.2						
	Case, publication:	Replace	0.2						
	Clamp, hose, filter element sleeve:	Replace	0.3						
	Connections, Siamese:	Replace	0.3						
	Flange, blind:	Replace	0.3						
	Float, water source supply:	Replace	0.2						
	Gasket, hose:	Replace	0.2						
	Hose, water:	Replace	0.2						
	Nozzle:	Replace	0.3						
	Power cable:	Replace	0.2						
	Strainer:	Replace	0.4						
	Valve:	Replace	0.4						
07	ELECTRIC MOTORS (OTHER THAN ENGINE) ACCESSORIES)								
	Motor Assembly:								
	Motor, alternating current agitator drive:	Service	0.4						
		Inspect	0.4						
		Replace		0.5					
	Motor, alternating current, slurry feeder:	Service	0.2						
		Inspect		0.2					
		Replace		0.5					
	Motor, alternating current, filter, raw water pumps:	Service	0.2						
		Inspect	0.2						
		Repair		1.0					
		Replace		0.5					
		Overhaul					2.0		
	Frame support and housing:	Inspect	0.2						
		Adjust	0.2						
		Replace	0.5						
	Slurry feeder, motor drive belt:	Inspect	0.2						
		Adjust	0.2						
		Replace		1.0					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
07	**ELECTRIC MOTORS (OTHER THAN ENGINE ACCESSORIES) (Cont)**								
	Motor drive pulleys:	Inspect	0.2						
		Replace		1.0					
	Controls starting, main or auxiliary: Magnetic Motor Starters:	Service	0.2						
		Inspect	0.2						
		Repair				0.3			
		Replace			0.5				
	Overload heaters:	Inspect		0.2					
		Replace		0.3					
	Operating coil	Inspect		0.2					
		Replace		0.3					
08	**ELECTRICAL EQUIPMENT, TRANSMISSION AND DISTRIBUTION.**								
	Transformer, Power Line or Distribution: Transformer, power, step-down:	Replace			1.5				
	Circuit breaker:	Inspect	0.2						
		Service		0.4					
		Replace		0.4					
	Cut-Out Devices: Door switches, blackout:	Replace		0.5					
	Toggle switches, blackout:	Replace		0.5					
	Sensitive switch, low water level:	Replace		0.5					
	Alarm switch, toggle:	Replace		0.5					
	Start - Stop Control switches:	Inspect	0.2						
		Service	0.2						
		Replace		0.5					
	Signaling Devices: Indicator light, wet well:	Inspect	0.2						
		Repair		0.5					
		Replace		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
08	ELECTRICAL EQUIPMENT, TRANSMISSION AND DISTRIBUTION. (Cont)								
	Buzzer:	Inspect	0.2						
		Replace		0.5					
	Instruments - Ammeter voltmeter:	Inspect	0.2						
		Replace		0.5					
		Test		0.2					
	Power Receptacles	Inspect	0.2						
		Replace		0.4					
	Control Panels and Housing								
	cabinet assembly, electrical control panel:	Inspect	0.5						
		Replace			1.0				
	Terminal board assembly	Inspect		0.2					
		Replace			1.5				
	Nonrotating Rectifiers Converters: Inverters:								
	Power supply assy	Inspect		0.4					
		Replace		1.0					C
	Rectifier:	Inspect		0.4					
		Replace		1.0					
	Fuse holder and fuse:	Inspect		0.4					
		Replace		0.5					
	Transformer	Inspect		0.4					
		Replace		0.5					
	Capacitor	Inspect		0.3					
		Replace		0.5					
	Terminal block panel	Inspect		0.4					
		Replace		1.0					C
	Miscellaneous Wiring; Fittings:								
	Power cable assemblies:	Inspect	0.2						
		Replace		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
08	ELECTRICAL EQUIPMENT, TRANSMISSION AND DISTRIBUTION. (Cont)								
	Conduit:	Replace			1.5				
	Wiring	Replace		1.0					
	Rod assembly, ground:	Replace	0.3						
09	GAGES (NON-ELECTRICAL); WEIGHING AND MEASURING DEVICES								
	Pressure Gages:								
	Raw water pressure gage:	Service		0.2					
		Inspect		0.2					
		Replace		0.5					
	Filter pressure gages	Service		0.2					
		Inspect		0.2					
		Replace		0.5					
	Fittings:	Replace		0.2					
	Gage Mountings:								
	Filter gage mounting:	Replace		0.4					
	Raw water rate of flow indicator mounting:	Replace		0.4					
	Flow Meters:								
	Raw water rate of flow indicator:	Service	0.2						
		Inspect	0.2						
		Replace		0.5					
		Test					0.5		
		Calibrate					0.5		
		Overhaul					1.0		
	Orifice plate gasket,	Replace		0.5					
	orifice plate:	Replace		0.5					
10	WATER PURIFICATION								
	Tanks, Containers:								
	Feeder assembly, chemical slurry:	Service	0.5						
		Inspect	0.5						
		Repair			3.0				
		Replace			5.0				
	Plastic Windows and gaskets:	Inspect		0.2					
		Repair		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
10	WATER PURIFICATION (Cont)								
	Tank assembly, erdlator:	Service	0.4						
		Inspect	0.4						
		Repair		1.0					
		Replace		4.0					
	Effluent launder rod:	Adjust	0.4						
		Inspect		0.2					
		Repair		0.8					
		Replace		0.5					
	Launders effluent and influent:	Replace			1.0				
	Bridge rails:	Inspect	0.2						
		Repair		1.0					
		Replace		0.5					
	Piping valves:								
	Piping assembly, erdlator, raw water:								
	Aspirators	Inspect		0.5					
		Replace		1.0					
	Water level alarm assembly:								
	Float valve:	Inspect	0.2						
		Repair		0.8					
		Replace		0.5					
	Low level alarm float:	Adjust	0.2						
		Inspect		0.2					
		Service		0.2					
		Replace		0.5					
	Plastic tubing:	Service		0.2					
		Replace		0.5					
	Ejector assembly, slurry:	Inspect		0.2					
		Service		0.2					
		Repair		0.5					
		Replace		0.5					
	Piping assembly, suction, concentrator tank:	Inspect		0.2					
		Repair		0.5					
		Replace		1.5					
	Piping assembly, erdlator coagulated water (slurry weir box to sludge concentrator tank):								

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
10	WATER PURIFICATION (Cont)								
	Door Latches:	Inspect		0.2					
		Replace		0.5					
	Bearing packing:	Adjust		0.5					
		Replace		1.0					
	Feeder, chemical solution, water purification:	Service	0.5						
		Inspect	0.5						
		Repair			2.5				
		Replace		1.5					
		Overhaul					5.0		
	Poppet, valves, seat, gaskets and diaphragm:	Service	0.5						
		Replace	1.0						
	Effluent launder tube:	Inspect	0.2						
		Replace		0.5					
	Filter assembly, diatomite:	Replace		1.0					
	Lower filter housing and filter housing cover:	Service	0.3						
		Inspect	0.2						
		Repair		1.5					
		Replace		1.0					
	Filter elements:	Service	0.5						
		Inspect	0.5						
		Repair	1.0						
		Replace	0.5						
	Tank, waster water and grating:	Inspect	0.2						
		Service	0.2						
		Replace		1.5					
	Tank, chemical solution with covers and stud:	Inspect	0.2						
		Service	0.2						
		Replace		1.5					
	Tank diatomite dilution:	Service	0.4						
		Inspect	0.4						
		Repair		1.0					
		Replace		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
10	WATER PURIFICATION (Cont)								
	Piping assembly, erdlator coagulated water (slurry weir box to sludge concentrator tank):	Inspect		0.2					
		Replace		1.5					
	Piping assembly, chemical:	Inspect		0.2					
		Replace		1.5					
	Piping assembly, raw water:	Inspect		0.2					
		Replace		1.5					
	Sight glass assembly:	Service		0.2					
		Inspect		0.2					
		Repair		0.5					
	Piping assembly, waste water:	Inspect		0.2					
		Replace		1.5					
	Piping assembly, coagulated water:	Inspect		0.2					
		Replace		1.5					
	Valve, plug:	Service	0.2						
		Repair			1.0				
		Replace		0.5					
	Valve, flow regulating:	Service	0.2						
		Repair			1.0				
		Replace		0.5					
	Piping assembly, diatomite filter:	Inspect		0.2					
		Replace		1.5					
	Valve, plug:	Service	0.2						
		Repair			1.0				
		Replace		0.5					
	Valve assembly, air release	Inspect		0.2					
		Repair			1.0				
		Replace		0.5					
	Gasket, air release valve to filter:	Inspect		0.2					
		Replace		0.5					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
10	WATER PURIFICATION (Cont)								
	Water Test Equipment:								
	Comparator with carrying case:	Service	0.2						
		Replace	0.2						
	Prism assembly:	Replace	0.2						
	Front cover:	Replace	0.2						
	Body:	Replace	0.5						D
	Disk:	Replace	0.5						
	Comparator body and battery compartment:	Repair		1.0					
		Replace		0.5					E
	Multiple Take-off (Line Drives):								
	Chemical feed equipment drives:								
	Chain guard:	Inspect	0.2						
		Replace		0.5					
	Gear assembly speed reducer:	Service	0.5						
		Inspect		0.5					
		Repair		1.0					
		Replace		1.0					
	Keys, sprocket, pulley:	Replace		0.5					
	Chain tightener and sprocket:	Service	0.2						
		Adjust	0.5						
		Repair		0.8					
		Replace		0.5					
	Drive chain:	Adjust	0.5						
		Inspect		0.5					
		Replace		0.8					
	Safety slip clutch and sprocket:	Adjust	0.2						
		Service		0.2					
		Inspect		0.2					
		Repair		0.5					
		Replace		1.0					

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
10	WATER PURIFICATION (Cont)								
	Erdlator equipment drive:								
	Erdlator agitator drive shaft assembly (including coupling, pillow block bearings, collars and pulleys):	Service	0.5						
		Inspect	0.5						
		Repair		1.5					
		Replace		1.0					
	Shaft, disk, hub and bushing	Replace			1.5				
	Gear assembly, speed reducer:	Service	0.2						
		Inspect	0.2						
		Repair			1.5				
		Replace			1.0				
	Flexible shaft coupling:	Inspect		0.2					
		Replace		0.5					
11	PUMP (EXCLUDE ENGINE PUMPS).								
	Pump Assembly:								
	Pump Assembly filter:	Service	0.5						
		Inspect	0.5						
		Replace			2.0				
		Overhaul					2.0		
	Pump assembly raw, water:	Service	0.5						
		Inspect	0.5						
		Replace		1.0					
		Overhaul					1.5		
	Peeler, pump	Repair		1.5					
	Volute housing:								
	Housing:	Replace			1.8				
	Seal assembly:	Replace			1.5				
	Impeller; Rotor, Diaphragm	Replace			1.5				
	Suction valve								
	Suction Heads:	Replace			1.5				
	Gasket	Replace			1.5				
	Hose Fittings	Inspect	0.2						
		Replace	0.5						

Section II. MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance Level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
12	PRECISION AND TOPOGRAPHICAL INSTRUMENTS								
	Levels:	Inspect							
		Replace		0.5					
13	FIRE FIGHTING EQUIPMENT:								
	Fire Extinguishers:	Service			0.5				
		Replace	0.2						

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Section II. MAINTENANCE ALLOCATION CHART

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. Scope.

This appendix lists expendable supplies and materials you will need to operate and maintain the water purification unit. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns.

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in narrative instructions to identify the material (e.g., "Use Cleaning compound, item 1, App. E").

b. Column 2, Level. This column identifies lowest level of maintenance that requires listed item.

C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates part number, followed by Federal Supply Code for Manufacturer, (FSCM) in parentheses, if applicable.

e. Column 5, Unit of Measure (U/M). Indicates measure used in performing actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If unit of measure differs from unit of issue, requisition lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	C		Cleaning Solvent (P-D-680)	ga
2	C		Hydrochloric Acid (5%)	ga
3	C		Cleaning Solvent, Non-mineral Base	ga
4	C	6810-00-242-4770	Calcium Hyprochlorite, O-C-114, Type I	3 3/4 lb
5	C	6810-00-264-6575	Charcoal, Activated, Powder, MIL-C-506	50 lb
6	C	6810-00-664-0283	Ferric Chloride, Anhydrous, Crystalline	1 lb
7	C	9390-00-443-4703	Diatomaceous Earth, Powder, MIL-F-52637	3 cu ft.
8	C	6810-00-585-2017	Limestone, Pulverized, Calcium Carbonate, MIL-L-14519	100 lb
9	C	6810-00-087-2340	Indicator Solution, PH wide range MIL-I-52701	pt
10	C	6810-00-270-8289	Orthotolidine Dihydrochloride Solution UXA7787	pt
11	C	6810-00-986-3471	Sodium Arseuite Solution UXA9931	pt
12	C	6810-01-044-0315	Tablet, Reagent DPD	ea

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6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-4610-221-12	5 Mar 79	Water Purification Unit

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Charts Transposed to

End of Volume.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimenter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 38.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimenter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	newton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C